



# **Volume 2 of 2 Project Manual**

**WILLARD DILORETO PARKING GARAGE  
55 Manafort Senior Drive  
New Britain, CT  
Project No.: CF-RC-402**

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**Project Manual Date: 02/07/20**



## VOLUME 1 of 2

## DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

Section No.	Title	Page Count	Not Used
00 01 01	Title Page	1	<input type="checkbox"/>
00 01 07	Seals Page	1	<input type="checkbox"/>
00 01 10	Table of Contents	8	<input type="checkbox"/>
00 01 15	List of Drawing Sheets	4	<input type="checkbox"/>
00 11 16	Invitation to Bid	3	<input type="checkbox"/>
00 21 13	<b>NEW:</b> Instructions To Bidders	17	<input type="checkbox"/>
00 25 13	<b>NEW:</b> Pre-Bid Meeting Agenda	4	<input type="checkbox"/>
00 30 00	General Statements for Available Information	7	<input type="checkbox"/>
00 30 10	General Statement for Existing Conditions Information		<input checked="" type="checkbox"/>
00 30 20	General Statement for Environmental Assessment Information		<input type="checkbox"/>
00 30 30	General Statement for Hazardous Building Materials Inspection and Inventory		<input checked="" type="checkbox"/>
00 30 40	General Statement for Subsurface Geotechnical Report		<input type="checkbox"/>
00 30 50	General Statement for Elevator Agreement		<input type="checkbox"/>
00 30 60	General Statement for FM Global Checklist for Roofing Systems		<input type="checkbox"/>
00 30 70	General Statement for "Statement of Special Inspections"		<input checked="" type="checkbox"/>
00 30 80	General Statement for Other Information		<input checked="" type="checkbox"/>
00 31 32	Geotechnical Data	1	<input type="checkbox"/>
00 40 14	Certificate of Authority	2	<input type="checkbox"/>
00 40 15	CT DAS Contractor Prequalification Forms	4	<input checked="" type="checkbox"/>
00 41 00	Bid Proposal Form	10	<input type="checkbox"/>
00 41 10	<b>NEW:</b> Bid Package Submittal Requirements	4	<input type="checkbox"/>
00 43 16	Standard Bid Bond	1	<input type="checkbox"/>
00 45 14	General Contractor Bidder's Qualification Statement	7	<input type="checkbox"/>
00 45 15	Objective Criteria Established for Evaluating Qualifications of Bidders	3	<input type="checkbox"/>
00 45 17	Named Subcontractor Bidder's Qualification Statement	7	<input type="checkbox"/>
00 52 03	Contract	3	<input type="checkbox"/>
00 52 73	Subcontract Agreement Form	3	<input type="checkbox"/>
00 62 16	Certificate of Insurance	1	<input type="checkbox"/>
00 6216.1	Asbestos Attachment to Acord Form		
00 72 13	General Conditions of the Contract for Construction – For Design-Bid-Build	33	<input type="checkbox"/>
00 72 13.1	Supplementary Conditions		
00 73 27	Set-Aside Contractor Schedule	1	<input type="checkbox"/>
00 73 38	CHRO Contract Compliance Regulations	7	<input type="checkbox"/>
00 73 44	Prevailing Wage Rates/Contractor's Wage Certification/Payroll Certification	28	<input type="checkbox"/>
00 73 63	CT DOC Security Requirements	3	<input checked="" type="checkbox"/>
00 92 10	Additional Forms To be Submitted After Bond Commission Funding Approval	7	<input type="checkbox"/>
00 92 30	Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors	2	<input type="checkbox"/>

\* Forms and Documents in separate package

**VOLUME 1 of 2**  
(continued)

**TECHNICAL SPECIFICATIONS**

**DIVISION 01 GENERAL REQUIREMENTS**

Section No.	Title	Page Count	Not Used
01 11 00	Summary of Work	9	<input type="checkbox"/>
01 20 00	Contract Considerations	5	<input type="checkbox"/>
01 23 13	Supplemental Bids	2	<input type="checkbox"/>
01 25 00	Substitution Procedures	5	<input type="checkbox"/>
01 26 00	Contract Modification Procedures	3	<input type="checkbox"/>
01 29 76	Progress Payment Procedures	6	<input type="checkbox"/>
01 31 00	Project Management and Coordination	5	<input type="checkbox"/>
01 31 19	Project Meetings	4	<input type="checkbox"/>
01 32 16	Construction Progress Schedules	4	<input type="checkbox"/>
01 32 16.13	CPM Schedules		X
01 32 33	Photographic Documentation	2	<input type="checkbox"/>
01 33 00	Submittal Procedures	9	<input type="checkbox"/>
01 35 16	Alteration Project Procedures		X
01 35 26	Government Safety Requirements	13	<input type="checkbox"/>
01 42 20	Reference Standards & Definitions	3	<input type="checkbox"/>
01 45 00	Quality Control	5	<input type="checkbox"/>
01 45 23.13	Testing for Indoor Air Quality, Baseline Indoor Air Quality, and Materials		X
01 50 00	Temporary Facilities & Controls	14	<input type="checkbox"/>
01 56 39	Temporary Tree and Plant Protection	2	
01 57 14	Temporary Dust Control	2	
01 57 30	Indoor Environmental Control	14	<input checked="" type="checkbox"/>
01 57 40	Construction Indoor Air Quality Management Plan		X
01 60 00	Product Requirements	3	<input type="checkbox"/>
01 71 23	Field Engineering	2	<input type="checkbox"/>
01 73 29	Cutting and Patching	4	<input type="checkbox"/>
01 74 19	Construction Waste Management & Disposal	5	<input type="checkbox"/>
01 75 00	Starting & Adjusting	2	<input type="checkbox"/>
01 77 00	Closeout Procedures	5	<input type="checkbox"/>
01 78 23	Operation & Maintenance Data	5	<input type="checkbox"/>
01 78 30	Warranties & Bonds	4	<input type="checkbox"/>
01 80 13	Sustainable Design Requirements		X
01 91 00	Commissioning		X

**VOLUME 1 of 2  
(continued)**

**DIVISION 02 EXISTING CONDITIONS Not Used**

Section No.	Title	Page Count
02 21 13	Project Surveying and Layout	3
02 41 23	Site Demolition	3

**DIVISION 03 CONCRETE Not Used**

Section No.	Title	Page Count
03 10 00	Concrete Forming and Accessories	6
03 20 00	Concrete Reinforcing	5
03 30 00	Cast-in-Place Concrete	17
03 41 00	Structural Precast Concrete	13
03 49 00	Fibrous Reinforcing	2

**DIVISION 04 MASONRY Not Used**

Section No.	Title	Page Count
04 20 00	Unit Masonry	5

**DIVISION 05 METALS Not Used**

Section No.	Title	Page Count
05 31 00	Metal Decking	4
05 40 00	Cold Formed Metal Framing	3
05 50 00	Miscellaneous Metals	7

**DIVISION 06 WOOD, PLASTICS AND COMPOSITES Not Used**

Section No.	Title	Page Count
06 10 00	Rough Carpentry	4
06 16 43	Fiberglass-Mat Gypsum Sheathing	2

**DIVISION 07 THERMAL AND MOISTURE PROTECTION Not Used**

Section No.	Title	Page Count
07 10 00	Waterproofing and Dampproofing	2
07 18 00	Traffic Bearing Waterproofing Membrane	6
07 19 00	Clear Penetrating Concrete Sealer	3
07 26 00	Insulation and Vapor Barriers	4
07 41 21	Uninsulated Metal Panels	3
07 53 11	Single Ply Adhered Roofing	8
07 60 00	Flashing and Sheet Metal	1
07 91 00	Expansion Joint Seals	3
07 92 00	Joint Sealants	8

**VOLUME 1 of 2**  
(continued)

**DIVISION 08** **OPENINGS** Not Used

Section No.	Title	Page Count
08 11 13	Hollow Metal Work	7
08 33 10	Coiling Steel Doors	3
08 34 10	Rolling Grilles	4
08 51 13	Aluminum Assemblies	5
08 70 00	Finish Hardware	4
08 80 00	Glass and Glazing	4
08 90 10	Glazed Aluminum Curtain Walls-Garage Stair Towers	7
08 92 00	Structural Silicone Glazed Curtain Wall System – Pedestrian Bridge	9

**DIVISION 09** **FINISHES** Not Used

Section No.	Title	Page Count
09 25 00	Gypsum Drywall	5
09 54 70	Metal Plank Ceilings	4
09 91 00	Painting	6

**DIVISION 10** **SPECIALTIES** Not Used

Section No.	Title	Page Count
10 20 00	Exterior Louvers	3
10 24 00	Metal Architectural Mesh	3
10 40 00	Signs, Graphics and Supports	3
10 44 13	Fire Extinguishers and Cabinets	4

**DIVISION 11** **EQUIPMENT** Not Used

Section No.	Title	Page Count
11 12 40	Parking Count & Guidance System (PCGS)	8
11 15 20	Vehicular Swing Gate Operator	1

**DIVISION 12** **FURNISHINGS** Not Used

Section No.	Title	Page Count
-------------	-------	------------

**DIVISION 13** **SPECIAL CONSTRUCTION** Not Used

Section No.	Title	Page Count
-------------	-------	------------

**DIVISION 14** **CONVEYING SYSTEMS** Not Used

Section No.	Title	Page Count
-------------	-------	------------

**VOLUME 1 of 2**  
(continued)

14 21 00	Electric Traction Elevators	11
----------	-----------------------------	----

DIVISION 15	RESERVED
-------------	----------

DIVISION 16	RESERVED
-------------	----------

DIVISION 17	RESERVED
-------------	----------

DIVISION 18	RESERVED
-------------	----------

DIVISION 19	RESERVED
-------------	----------

DIVISION 20	RESERVED
-------------	----------

<b>DIVISION 21</b>	<b>FIRE SUPPRESSION</b>	Not Used <input type="checkbox"/>
--------------------	-------------------------	-----------------------------------

Section No.	Title	Page Count
21 05 17	Sleeves and Sleeve Seals for Fire-Suppression Piping	2
21 05 23	General-Duty Valves for Fire Protection Piping	5
21 05 48	Vibration and Seismic Controls for Fire-Suppression Piping and Equipment	7
21 05 53	Identification for Fire-Suppression Piping and Equipment	7
21 11 19	Fire Department Connections	3
21 12 00	Fire Suppression Standpipes	7
21 13 13	Wet-Pipe Sprinkler Systems	11

<b>DIVISION 22</b>	<b>PLUMBING</b>	Not Used <input type="checkbox"/>
--------------------	-----------------	-----------------------------------

Section No.	Title	Page Count
22 05 17	Sleeves and Sleeve Seals for Plumbing Piping	3
22 05 23.12	Ball Valves for Plumbing Piping	4
22 05 29	Hangers and Supports for Plumbing Piping and Equipment	12
22 05 53	Identification for Plumbing Piping and Equipment	8
22 11 16	Domestic Water Piping	8
22 11 19	Domestic Water Piping Specialties	4
22 13 16	Sanitary Waste and Vent Piping	7
22 13 19	Sanitary Waste Piping Specialties	3
22 13 19.13	Sanitary Drains	3
22 14 16	Storm Drainage Piping	7
22 14 23	Storm Drainage Piping Specialties	4

<b>DIVISION 23</b>	<b>HEATING, VENTILATING AND AIR CONDITIONING</b>	Not Used <input type="checkbox"/>
--------------------	--	-----------------------------------

Section No.	Title	Page Count
23 00 00	Basic Mechanical Requirements	4
23 05 17	Sleeves and Sleeve Seals for HVAC Piping	4
23 05 29	Hangers and Supports for HVAC Piping and Equipment	3
23 05 48	Vibration and Seismic Control	11
23 05 53	Identification for HVAC Piping and Equipment	4
23 05 93	Testing, Adjusting, and Balancing for HVAC	13
23 07 13	Duct Insulation	14
23 07 19	HVAC Piping Insulation	17
23 09 93.11	Sequence of Operations for HVAC DDC	7

**VOLUME 1 of 2**  
**(continued)**

23 23 00	Refrigerant Piping	11
23 31 13	Metal Ducts	14
23 33 00	Air Duct Accessories	8
23 34 23	HVAC Power Ventilators	7
23 37 13	Diffusers, Registers and Grilles	4
23 74 35	Condensing Units	4
23 82 19	Fan Coil Units	9
23 82 39	Electric Cabinet Wall and Unit Heaters	3

**DIVISION 24** **RESERVED**

**DIVISION 25** **INTEGRATED AUTOMATION** **Not Used**

Section No.	Title	Page Count

**DIVISION 26** **ELECTRICAL** **Not Used**

Section No.	Title	Page Count
26 05 00	Common Work Results for Electrical	4
26 05 19	Low-Voltage Electrical Power Conductors and Cables	4
26 05 23	Control-Voltage Electrical Power Cables	12
26 05 26	Grounding and Bonding for Electrical Systems	5
26 05 29	Hangers and Supports for Electrical Systems	6
26 05 33	Raceway and Boxes for Electrical Systems	13
26 05 48	Vibration and Seismic Controls for Electrical Systems	8
26 05 53	Identification for Electrical Systems	10
26 09 23	Lighting Control Devices	9
26 12 00	Medium Voltage Transformers	7
26 13 29	Medium Voltage Pad Mounted Switchgear	18
26 24 16	Panelboards	9
26 27 26	Wiring Devices	6
26 28 13	Fuses	3
26 28 16	Enclosed Switches and Circuit Breakers	7
26 33 23	Central Battery Equipment	12
26 51 19	LED Interior Lighting	8
26 56 00	Exterior Lighting	12

**DIVISION 27** **COMMUNICATIONS** **Not Used**

Section No.	Title	Page Count
27 00 00	CSCU Telecommunications Infrastructure Standards	75
27 05 00	Common Work Results for Communications	5



**VOLUME 2 of 2  
(continued)**

27 11 00	Communications Equipment Room Fittings	7
27 15 00	Communications Horizontal Cabling	18
27 16 00	Communications Termination Hardware & Equipment	7

**DIVISION 28** **ELECTRONIC SAFETY AND SECURITY**  Not Used

Section No.	Title	Page Count
28 13 01	Persona Access Control	17
28 31 11	Digital, Addressable Fire-Alarm System	12

**DIVISION 29** **RESERVED**

**DIVISION 30** **RESERVED**

**DIVISION 31** **EARTHWORK**  Not Used

Section No.	Title	Page Count
31 11 00	Clearing and Grubbing	2
31 20 00	Earthwork	13
31 23 16	Excavation for Pavement	4
31 23 33	Trench Excavation	3
31 25 00	Soil Erosion and Sediment Control	2
31-63-17	Aggregate Piers for Subgrade Stiffening	6

**DIVISION 32** **EXTERIOR IMPROVEMENTS**  Not Used

Section No.	Title	Page Count
32 00 00	General Site Requirements	5
32 12 16	Asphaltic Concrete Paving	5
32 13 13	Portland Cement Concrete Paving	4
32 16 13	Curb & Sidewalk	4
32 17 23	Pavement Marking	2
32 91 13	Topsoiling	4
32 92 00	Seeding	4
32 93 00	Trees, Plants and Groundcover	6

**DIVISION 33** **UTILITIES**  Not Used

Section No.	Title	Page Count
33 11 16	Site Water	4
33 30 00	Site Sanitary Sewers	4
33 41 00	Storm Sewer	6
33 71 00	Utilities	3

**VOLUME 2 of 2  
(continued)**

DIVISION 50		PROJECT-SPECIFIC AVAILABLE INFORMATION	Not Used <input type="checkbox"/>
Section No.	Title	Page Count	
50 20 00	Environmental Assessment Information	357	
	WSP Soils Estimate	114	
50 40 00	Subsurface Geotechnical Report	47	
	Foundation Analysis	9	
50 50 00	Elevator Agreement	2	
50 60 00	FM Global Checklist for Roofing Systems	3	
50 70 00	Statement of Special Inspections	1	
APPENDIX A: SPECIAL PROVISIONS: TRAFFIC SIGNAL DESIGN		135	
<b>APPENDIX</b>			

00 01 10 Table of Contents



## *Telecommunications Infrastructure Standards*

Version: 4.0

Revision Date: December 20, 2016

The Telecommunications Infrastructure Standards contained here have been adopted and are to be applied to the system office and the Colleges and Universities that make up the Connecticut State Colleges and Universities (CSCU).

### **Community Colleges**

*Asnuntuck Community College*  
*Capital Community College*  
*Charter Oak State College*  
*Gateway Community College*  
*Housatonic Community College*  
*Manchester Community College*  
*Middlesex Community College*  
*Naugatuck Valley Community College*  
*Northwestern CT Community College*  
*Norwalk Community College*  
*Quinebaug Valley Community College*  
*Three Rivers Community College*  
*Tunxis Community College*

### **State Universities**

*Central Connecticut State University*  
*Eastern Connecticut State University*  
*Southern Connecticut State University*  
*Western Connecticut State University*

## Table of Contents

<b>1.</b>	<b>INTRODUCTION.....</b>	<b>4</b>
<b>2.</b>	<b>GENERAL.....</b>	<b>6</b>
2.1.	INTRODUCTION.....	6
2.2.	GENERAL REQUIREMENTS .....	6
2.3.	CSCU INFRASTRUCTURE CABLING REQUIREMENTS .....	9
<b>3.</b>	<b>INTERIOR TELECOMMUNICATIONS PATHWAYS.....</b>	<b>13</b>
3.1.	GENERAL INFORMATION AND INSTALLATION PRACTICES .....	13
3.2.	PATHWAY DESIGN .....	15
3.3.	CONDUIT TYPES .....	17
3.4.	CONDUIT INSTALLATION .....	18
3.5.	PULL BOXES.....	19
3.6.	CABLE TRAY SYSTEMS .....	20
3.7.	CABLE HANGERS .....	22
3.8.	OUTLET BOXES .....	23
3.9.	PERIMETER RACEWAYS .....	25
3.10.	FLOOR BOXES / POKE-THROUGHS .....	25
3.11.	POWER POLES .....	25
3.12.	FURNITURE IN-FEEDS .....	26
3.13.	UNDERFLOOR PATHWAYS.....	26
<b>4.</b>	<b>OUTSIDE PLANT TELECOMMUNICATIONS PATHWAYS .....</b>	<b>27</b>
4.1.	GENERAL INFORMATION.....	27
4.2.	MANHOLES.....	28
4.3.	INSTALLATION GUIDELINES AND REQUIREMENTS .....	30
4.4.	OUTSIDE PLANT CONDUIT INSIDE A BUILDING .....	31
<b>5.</b>	<b>TELECOMMUNICATIONS SPACES.....</b>	<b>32</b>
5.1.	OVERVIEW. ....	32
5.2.	DEFINITIONS.....	32
5.3.	PROHIBITED USE OF TELECOMMUNICATIONS SPACES .....	32
5.4.	BUILDING DEMARCATION POINT (BDP).....	33
5.5.	MAIN EQUIPMENT ROOM (MER).....	34
5.6.	TELECOMMUNICATIONS ROOM (TR) .....	44
5.7.	EQUIPMENT RACKS, CABINETS, AND CABLE MANAGEMENT.....	47
<b>6.</b>	<b>BACKBONE CABLING.....</b>	<b>51</b>
6.1.	INTER-BUILDING COPPER BACKBONE CABLING (OUTSIDE PLANT).....	51
6.2.	INTER-BUILDING FIBER OPTIC CABLING .....	51
6.3.	INTRA-BUILDING COPPER BACKBONE CABLING (INSIDE PLANT).....	51
6.4.	INTRA-BUILDING FIBER BACKBONE CABLING (INSIDE PLANT) .....	52
6.5.	COAXIAL BACKBONE CABLING .....	52
6.6.	TERMINATION OF BACKBONE CABLING .....	52

<b>7.</b>	<b>INSIDE BUILDING HORIZONTAL CABLING .....</b>	<b>55</b>
7.1.	PROHIBITED .....	55
7.2.	GENERAL REQUIREMENTS .....	55
7.3.	HORIZONTAL FIBER CABLING.....	56
7.4.	HORIZONTAL COAX CABLING.....	56
7.5.	HORIZONTAL COPPER CABLING.....	57
<b>8.</b>	<b>GROUNDING AND BONDING .....</b>	<b>62</b>
8.1.	OVERVIEW .....	62
8.2.	TMGB – TELECOMMUNICATIONS MAIN GROUNDING BUSBAR .....	62
8.3.	TGB – TELECOMMUNICATIONS GROUNDING BUSBAR.....	63
8.4.	TBB – TELECOMMUNICATIONS BONDING BACKBONE.....	63
8.5.	RACK GROUNDING.....	65
8.6.	PATHWAY GROUNDING.....	65
8.7.	EQUIPMENT GROUNDING .....	65
8.8.	GROUNDING OF OUTDOOR WIRELESS ACCESS POINTS AND OTHER ANTENNA EQUIPMENT .....	65
8.9.	TESTING AND DOCUMENTATION OF GROUNDING .....	66
<b>9.</b>	<b>TESTING, ACCEPTANCE, DOCUMENTATION AND LABELING.....</b>	<b>67</b>
9.1.	TEST REQUIREMENTS FOR HORIZONTAL COPPER CABLING.....	67
9.2.	TEST REQUIREMENTS FOR FIBER OPTIC CABLING SYSTEM .....	68
<b>10.</b>	<b>LABELING .....</b>	<b>70</b>
10.1.	OVERVIEW .....	70
10.2.	LABELING OF CABLING AND TERMINATION COMPONENTS.....	70
10.3.	FIBER OPTIC BACKBONE, RISER CABLES AND TERMINATION COMPONENTS .....	70
10.4.	STANDARD WORK OUTLET FACEPLATES .....	70
10.5.	DATA PATCH PANELS .....	71
10.6.	FIBER OPTIC CABLES AND TERMINATION COMPONENTS .....	71
10.7.	GROUND SYSTEM LABELING .....	71
<b>11.</b>	<b>DOCUMENTATION.....</b>	<b>72</b>
<b>A.</b>	<b>APPENDIX A .....</b>	<b>73</b>

## 1. Introduction

- 1.1 The Connecticut State Colleges & Universities (CSCU) has adopted the ANSI/TIA (American National Standards Institute, Telecommunications Industry Association) Standards and BICSI (Building Industry Consulting Service International) practices regarding the installation of structured cabling systems constructed with a minimum of Category 6 compliant components. Liberal reference to these standards and practices are made throughout this document, and the Colleges/Universities are encouraged to consult the original documents for more detailed information on wiring standards. This document is intended to summarize and highlight significant aspects of these standards and practices for the purpose of creating a simplified reference which Colleges/Universities may use in the planning, bid preparation, and implementation of a Structured Cabling System for their campus.
- 1.2 Each College/University is expected to adhere to the elements identified in this document for the implementation of any new wiring projects. Compliance with these standards will result in model installations which are easy to administer and modify when necessary, and which will in turn guarantee optimal performance from the network.
- 1.3 These standards are intended to allow CSCU to meet the telecommunications requirements of the Colleges and Universities for the next 15-20 years. It is essential that CSCU Network Management shall be consulted prior to and throughout the planning and design process to ensure that present and future voice and data service requirements can be met.
- 1.4 CSCU Information Technology (IT) Management **MUST** provide prior written approval for any deviations from these standards, or CSCU will not assume financial responsibility to upgrade the facility to performance expectations. Where ambiguity or questions arise to specific details not mentioned in these standards, appropriate TIA, NEC, and BICSI standards shall apply.
- 1.5 All applicable building codes must be strictly adhered to in regards to telecommunications services. CSCU cannot authorize variations to any building codes. In situations where a variance to a building code is required, the request for a variance must be submitted in writing to OSBI (Office of State Building Inspector) and local building officials, and only implemented if approved in written by the AHJ (Authority Having Jurisdiction).
- 1.6 The use of a Commissioning Agent for the Telecommunications infrastructure is allowed, but is not required. A manufacturer's system warranty is required for all projects unless otherwise instructed by CSCU.

- 1.7 The following Standards documents are referenced throughout this document. Where a conflict exists between the Standards listed below, and the requirements in this document, the more stringent requirement shall take precedence.

ANSI/TIA-560-C.0	Generic Telecommunications Cabling for Customer Premises.
ANSI/TIA-568-C.1	Commercial Building Telecommunications Cabling Standard.
ANSI/TIA-568-C.2	Balanced Twisted-Pair Telecommunications Cabling and Components Standard.
ANSI/TIA-568-C.3	Optical Fiber Cabling Components
ANSI/TIA-569-D	Telecommunications Pathways and Spaces
ANSI/TIA-606-B	Administration Standard for Telecommunications Infrastructure.
ANSI/TIA-607-C	Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
IEEE 802.3af	Power over Ethernet (PoE) Standard.
IEEE 802.3at	Power over Ethernet+ (PoE+) Standard.
IEEE 802.3an	Physical Layer and Management Parameters
for	10Gbps Operation Type 10GBASE-T.
IEEE 802.11	Wireless Standards (including a/b/g/n/ac)

- 1.8 Construction specifications are a main ingredient of an Information Technology system. Information Technology systems shall adhere to these specifications in order to be functional in a wide variety of communications applications. This document does not allow or condone the avoidance of following any of the Laws, Standards, or Procedures of any, but not limited to the following:

- National Electrical Code (NEC)
- International Building Code
- Connecticut Building Code
- Connecticut Fire Code
- Building Industry Consulting Services International (BICSI)
- Americans with Disabilities Act (ADA)

The documents listed above shall be the current edition or as adopted by the AHJ.

## 2. General

### 2.1 Introduction

2.1.1 The CSCU Wiring Distribution System (CWDS) is viewed as the most critical physical element of the long-term telecommunications strategy. The Distribution System shall provide connectivity to all other major subsystems including voice, data and video requirements. Any new systems installed shall be incorporated into the existing Distribution Systems and should combine copper and fiber optic technologies to provide enhanced communications services.

### 2.2 General Requirements

2.2.1 Any new systems installed shall be incorporated into the existing Distribution Systems and should combine copper and fiber optic technologies to provide enhanced communications services.

2.2.2 Installers for new construction or renovations shall be responsible for all cable, wire, hardware, labor, and materials for full installation of a functioning Distribution System supporting the requirements of all systems including the Telephone Systems, Campus Data Network, Video Systems etc. This includes, but is not limited to, cross-connect fields, station cable, fiber and copper riser cable, protection, station jacks, raceways, Telecommunication Room construction, outside facilities and all associated hardware and labor.

2.2.3 NEC requirements do not allow cables no longer in use to remain in the ceiling plenum. All abandoned cables must be completely removed. Any cable installed, but not terminated for use, must be tagged in accordance with NEC requirements.

2.2.4 CSCU requires a secure distribution system while minimizing installation expense wherever possible. Designers and/or Installers shall consider the reuse of newly installed wire and fiber optic cabling in those buildings where new wire has been installed. Already installed wire and/or fiber optic cabling will be acceptable where it meets the Specifications in this document and CSCU IT Management.

2.2.5 CSCU requires fiber optic cables to be the media of choice for inter-building data and video cabling to minimize future congestion in new conduits and to be positioned to exploit emerging technologies that require fiber connectivity.

2.2.6 Installers shall coordinate the reconnection of facilities' cabling systems to the backbone infrastructure with CSCU IT Management and campus facilities personnel. All alarms shall be fully tested upon completion. During installation, the Installer shall not disturb fire alarm or other critical alarm circuits. If any such circuit is found to be inoperative between the time work commences in a building, but prior to system acceptance, the Installer shall immediately repair the circuit at no additional cost to the Owner.



- 2.2.7 All installation work shall be done in a neat and high quality manner. It is the responsibility of the Installer to ensure that all state and local building codes are met. Any costs for changes to materials in order to meet code requirements shall be borne by the Installer.
- 2.2.8 Each building requires a Building Demarcation Point (BDP) for terminating Service Provider facilities and the inter-building cabling; a Main Equipment Room (MER) will serve as the central point for Wiring Distribution System. Telecommunications Rooms (TR) are required for the termination of workstation cables and the cross-connections to the backbone cables. The Installer shall provide all hardware (e.g., mounting brackets, vertical and horizontal troughs, cable trays, etc.) within the Telecommunications Rooms.
- 2.2.9 Cross connection equipment used in the intra-building distribution system shall allow for direct termination of station and backbone cables on the blocks, and modular cross-connections between blocks.
- 2.2.10 All new construction or major renovation projects are required to have the design team either include or employ the services of a BICSI Registered Communications Distribution Designer (RCDD) to assist in planning and design of the telecommunications infrastructure. Additionally, CT State Statutes require licensure of individuals responsible for the design of Telecommunications systems per Public Act #01-164. The Telecommunications Infrastructure Layout Technician (TLT) license, issued by the Department of Consumer Protection, shall be presented upon request by CSCU, and may be required for stamping and signing of official design documents. Alternatively, those holding a Professional Engineer (PE) license may sign and stamp design documents.
- 2.2.11 All construction plans for BDP, MER and TRs shall be approved by the CSCU Telecommunications Department prior to construction. Approval shall also be obtained for the layout of the cross connect fields within the Telecommunications Rooms before work starts.
- 2.2.12 All Telecommunications plans shall be reviewed and approved by the campus as well as the CSCU Telecommunication Department before work starts.
- 2.2.13 All aspects of the telecommunications distribution infrastructure shall conform to the requirements contained herein. Any deviation from this specification in regard to the design and sizing of telecommunications spaces, vertical or horizontal pathways shall be brought to the attention of the CSCU Telecommunications Department and approval prior to the release of the bid specification.

- 2.2.14 The Installer shall be knowledgeable of all applicable industry standards including, but not limited to, NEC, ANSI/TIA and BICSI, and shall comply with all applicable regulations of the College/University, local, state, and federal governments. Any failure to pass inspections by any regulatory body shall be corrected wholly at the expense of the Installer and at no cost, whatsoever, to the Owner.
- 2.2.15 All work of this project shall conform to all applicable laws and ordinances and to the regulations of the local utility companies.
- 2.2.16 All components of the Installer's proposed systems shall meet the requirements of FCC Rules and Regulations Part 68 (Registration) and Part 15 (Emission and Interference). All Proposals shall include all license, permit, and registration numbers obtained in compliance with FCC Rules and Regulations.
- 2.2.17 Any deviations to specifications must be submitted in writing with justifications and be approved by the campus facilities office and the CSCU Telecommunications Department.
- 2.2.18 The Installer shall comply with all laws and regulations regarding safety, protection and insurance.
- 2.2.19 All equipment installed shall be firmly held in place by fastenings and/or supports, which are adequate to support their loads with an ample safety factor. Cable run in the ceiling must be self-supporting and cannot be affixed, in any way, to the framework of the hung ceiling.
- 2.2.20 All cables, (where applicable) regardless of length, shall be marked and/or numbered at both ends. Marking codes shall correspond to recognized standards and specifications. All cabling shall be neatly laced, dressed, and adequately supported. No splices will be allowed in system wiring other than at approved designated locations.
- 2.2.21 Care shall be exercised in wiring to avoid damage to cable and equipment both existing and new. All wiring and connectors shall be installed in strict adherence to standard communications installation practices and all applicable Federal, State, and Local Building codes. Contractor shall take all necessary precautions to protect the building areas adjacent to work. All openings required by the Contractor for the installation of any cable shall be sealed by the Contractor in accordance with applicable fire and building codes. Any permits required shall be obtained by the Contractor.
- 2.2.22 Under no circumstances shall any device be connected to Owner's data network without approval from the Owner. This includes any phone switch equipment, laptops, PC, network diagnosis tools, hubs, data switches, or any other device capable of connecting to the data network.

- 2.2.23 IP Addresses for any contractor-installed equipment will be furnished by CSCU. Only devices that have been configured with a CSCU provided IP Address, subnet mask, gateway address, etc. may be placed on the network, and only after receiving approval from CSCU.
- 2.2.24 At the conclusion of the project, all telecommunications cabinets will be vacuumed to remove dust, dirt, wire clippings, and other debris. All rack mount equipment in cabinets and free-standing racks will be dusted and the Telecom rooms left broom clean. All work-related rubbish must be removed from the buildings. In the case of a dispute, The Owner may remove the rubbish and charge the cost to the selected vendor/contractor.
- 2.2.25 All services provided for installation of structure cabling system shall be professional and conform to the highest standards and industry best practices. CSCU Telecommunications Department reserves the right to halt any installation due to poor workmanship. All work shall be defect free and the installer will replace, at their expense, any work found to be defective.
- 2.3 CSCU Infrastructure Cabling Requirements
- 2.3.1 The primary objective for the proposed cable infrastructure system is to implement a telecommunications distribution design that allows the cable plant to be flexible, manageable, and expandable. The system should provide the ability to adapt to changing user and technology environments without re-cabling the building to meet demands for increased bandwidth or services and to facilitate ongoing moves, adds or changes. Designed to support true ubiquitous connectivity to an intelligent transport network capable of spanning both the nation and the globe, the distribution design will recognize that building communications systems and media are dynamic and shall be able to support a variety of applications and services. The distribution design should be able to accommodate voice, video, data, public address systems, CATV, security and environmental control.
- 2.3.2 The building backbone infrastructure systems will consist of cable pathways, telecommunications rooms, equipment rooms, telecommunications entrance facilities, transmission media, and support facilities that meet the requirements of the Connecticut State Colleges and Universities. The proposed backbone system for data networking is a high bandwidth, low attenuation, fiber optic design that provides a universal transport system for voice, data, video and facilities systems. Coaxial cable for CATV and broadband applications will also be provided where applicable. The proposed telecommunications building backbone infrastructure shall meet code and comply with industry and CSCU System standards.

- 2.3.3 All products and installation procedures used as part of the horizontal and backbone cabling systems must be free from defects and support any current or future application ratified by IEEE, ANSI and ISO that is developed for an ANSI/TIA-568-C.0 compliant structured cabling system. A manufacturer's warranty shall be furnished at the completion of the project which guarantees system performance, the installed components, and the installation integrity of the horizontal and backbone cabling. This warranty must be valid for a minimum of 20 years. An example includes the Hubbell Mission Critical Warranty or equivalent.
- 2.3.4 The standards set forth in this document are basic standards for system wiring and components. These are minimal requirements only; a detailed system specification and design is required for each installation.
- 2.3.5 These standards and specifications shall be updated periodically to reflect the most current ANSI/TIA and BICSI standards. All wiring systems that are being upgraded shall meet these guidelines. To achieve a successful long-term cabling solution, CSCU established the following performance goals based on emerging technology:
- a. Cabling system shall operate the application(s) which the system was designed to support. Applications may include, but are not limited to: 10/100/1000 Mbps Ethernet (IEEE 802.3), 10Gbps Ethernet, and other network services and applications.
  - b. Provide a cable system with adequate bandwidth to deliver the network existing and future applications.
  - c. Provide a strong network foundation and physical connectivity for each campus to build upon to support the instructional and administrative data needs.
  - d. Provide a cable system than supports the majority of workstations upon implementation and that can be easily expanded in the areas to meet the individual campus instructional needs.
  - e. Provide a cable system that has high integrity, performance and usability based on the current ANSI/TIA Commercial Building Telecommunications Cabling Standard, BICSI and future ANSI/TIA and IEEE standards.
  - f. Cabling System must meet the ANSI/TIA-568-C.0 standards for Category 6 or better wiring as stated above. Any deviations from standards from this document will require the prior approval of CSCU.
- 2.3.6 Installer's Responsibilities
- 2.3.6.1 The Installer shall be fully responsible to the College/University for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by the contracted vendor.
  - 2.3.6.2 The Installer shall obtain and pay for all surveys, permits, licenses, inspections and fees, and make all deposits required for the proper execution of the work after award of Contract.
  - 2.3.6.3 The Installer shall be responsible for loss or damage in shipment, delivery and installation of all equipment, parts, and goods until time of transfer to and acceptance by the College/University.

- 2.3.6.4 The Installer shall guarantee that equipment provided will not endanger the safety of College/University employees or the public, damage, require change in, or alterations for equipment or other facilities of the College/University including telephone and data network systems, interfere with the proper functioning of telephone equipment or facilities, or otherwise injure the public in its use of telephone services.
  - 2.3.6.5 The Installer shall be responsible for full restoration of all surfaces including floors, walls, ceilings and interior finishes damaged, altered or changed; building, and grounds of the College/University to their original condition.
  - 2.3.6.6 The students, faculty and staff of the College/University will occupy the campus during the entire period of installation. The nature of the work of the students, faculty and staff of the College/University is such that there must be a minimum degree of interference from the contracted vendors, and the work is to be performed at such times as directed by the College/University.
  - 2.3.6.7 All installation efforts shall be coordinated with the College/University project manager prior to commencement of work.
  - 2.3.6.8 Unnecessary noise shall be avoided at all times and unavoidable noises must be reduced to a minimum.
  - 2.3.6.9 The Installer and his representatives shall exercise every precaution to protect and maintain free from damage portions of the campus and buildings adjacent to and adjoining the work. Damage to the buildings or campus must be repaired to the satisfaction of the College/University and at the expense of the Contracted vendors.
  - 2.3.6.10 The Installer shall install all equipment in accordance with the manufacturer's specifications.
- 2.3.7 Special Requirements
- 2.3.7.1 The CSCU Telecommunications Infrastructure Standards publication is intended to address standard installation practices for all of the Colleges and Universities, with safety and performance being the most important factors. While these standards are carefully monitored to ensure that the hardware and practices are technologically current, it is possible that some applications may require special consideration.

- 2.3.8 CSCU buildings frequently contain special purpose facilities and equipment with unique telecommunications requirements. Special telecommunications requirements may require deviation from these specifications. CSCU IT Management needs to be notified of these special requirements as early in the design process as possible.
- 2.3.8.1 The following is a short (but not all-inclusive) list of facilities and equipment that commonly have special telecommunications requirements:
- a. Data Centers or Computer Rooms
  - b. Computer labs or classrooms
  - c. Video conferencing rooms
  - d. Audio/Video and Broadcast equipment
  - e. Laboratories
  - f. Nursing simulation laboratories
  - g. Scientific Equipment
- 2.3.8.2 Installation designs and practices not specifically identified as standard in this document will require appropriate CSCU IT Management approval before connection to the campus voice or data network.

### 3. Interior Telecommunications Pathways

#### 3.1 General Information and Installation Practices

- 3.1.1 Communications Pathways are facilities used to distribute and support cable and connecting hardware between the MER and/or TR, and the work area outlet. Pathways that may be utilized are described in detail in Parts 3.3 thru 3.13 of this section.
- 3.1.2 Empty Raceways and Raceways installed for Telecommunications Systems including telephone, data, security, alarm, CATV, sound, video, low voltage conductors, etc. shall be installed as required by the National Electrical Code, as required for raceways specified in this Section and as indicated herein.
- 3.1.3 Backbone Communication Pathways
  - 3.1.3.1 Backbone Communication Pathways may consist of conduits and floor penetrations (i.e., sleeves or slots), which provide routing space for communication cables.
  - 3.1.3.2 Vertically aligned Telecommunications Rooms with connecting sleeves are the most common type of backbone pathway.
  - 3.1.3.3 Designer shall position cable sleeves adjacent to a wall, which can support backbone cables. Sleeves must not obstruct wall-terminating space. All sleeves must be constructed in accordance with the National Electrical Code (NEC) and local fire codes and has a minimum of 2-inch high curb from the finished floor.
  - 3.1.3.4 Quantity, size, location and spacing of all sleeves must be reviewed and approved by a structural engineer.
  - 3.1.3.5 Design sleeves with a 4-inch diameter unless a smaller size is required by the structural engineer.
- 3.1.4 Horizontal Communication Pathways
  - 3.1.4.1 Horizontal Distribution Systems (horizontal pathways and spaces) consist of structures that conceal, protect, and support horizontal cables between the communications workstation outlet and the horizontal cross connect in the serving telecommunications room.
  - 3.1.4.2 Horizontal communications pathways are used to distribute and support horizontal cable and connecting hardware between the workstation outlet and the telecommunications room. These pathways and spaces are the "container" for the horizontal cabling.
  - 3.1.4.3 **NOTE:** It is the responsibility of the Architect/Engineering Firm to review all proposed Horizontal Distribution Systems with CSCU to ensure the system design:
    - a. Makes optimum use of the ability of the horizontal cabling system to accommodate change
    - b. Is as unconstrained as possible by vendor dependence
    - c. Compliance with this document, Local, State, and Federal Codes
    - d. Compliance with ANSI/TIA-569-D.

- 3.1.5 Designer shall follow guidelines of ANSI/TIA-569-D for determining the number of 4-inch sleeves required.
- 3.1.6 Empty Raceways and Raceways installed for Telecommunications Systems including telephone, data, security, alarm, CATV, sound, video, low voltage conductors, etc. shall be installed as required by the National Electrical Code, as required for raceways specified in this Section and as indicated herein.
- 3.1.7 Terminate conduits with bushings. Provide grounding bushings for backbone and riser conduits and for conduits entering equipment rooms or Telecommunications Rooms. Ground conduits, cable trays and raceways to the local Telecommunications ground bus using braided hollow copper conductor equal to Belden #8669 (equivalent to #6 AWG).
- 3.1.8 Adequate expansion/compression fittings shall be used where crossing building expansion joints. Expansion fitting shall be multidirectional and have grounding jumpers, and shall be manufactured by O-Z Gedney, Crouse-Hinds or approved equal.
- 3.1.9 Raceways shall have expansion fittings installed as recommended by the manufacturer. Provide a minimum of one expansion fitting per one hundred feet or fraction thereof for non-metallic raceways.
- 3.1.10 Raceways and outlets shall be separated from sources of EMI and RFI such as transformers, ballasts and power lines. Do not install raceways parallel to power raceways unless four foot (1219mm) distance is maintained. Cross other raceways at 90 degrees. Maintain minimum 12 inch (305 mm) clearance in all directions from lighting fixtures and power wiring rated over 20 A. Maintain a minimum 6 inch (153 mm) clearance elsewhere from raceways and outlets. Maintain 48 inch (1220 mm) clearance from transformers. Clearances are measured all around raceway and outlets including through walls and floors.
- 3.1.11 Install raceways and outlets for power and telecommunications in separate stud wall or block cavities.
- 3.1.12 Align sleeves and conduits on opposite walls so there is a straight line between corresponding openings, parallel or perpendicular to Building Structure.
- 3.1.13 Non-metallic raceways or boxes are not allowed in interiors of buildings.



### 3.2 Pathway Design

3.2.1 The Architect and low voltage designer shall coordinate with the other design disciplines (i.e. mechanical, electrical, structural, etc.) to provide adequate telecommunications pathways designed for accessibility and growth. The Architect shall bear in mind that mechanical, structural and electrical facilities tend to be static systems while the telecommunications systems are dynamic in nature, subject to additions and changes to the telecommunications systems, over the life of the facility.

3.2.2 Horizontal Distribution Systems must be designed to accommodate diverse user applications including but not limited to:

- a. Data Communications including infrastructure for wireless networking.
- b. Cable TV (both Fiber/Coax and IP based)
- c. Audio Visual Systems
- d. Public Address Systems
- e. Distributed Antenna Systems
- f. Electronic Security (Access Control, Video Surveillance, Intrusion Detection, Audio/Video Intercom, etc.)

Note: The designer should also consider that other building information systems (e.g., building alarms and security, audio visual and audio PA system) may require area/space in the Horizontal Distribution System and should plan with these facilities accordingly.

3.2.3 Telecommunications Spaces and pathway design shall accommodate and facilitate continuing changes and allow for a minimum of 50% growth.

3.2.4 Telecommunication spaces and pathway shall not be located in stairways, elevator shafts or elevator equipment rooms.

3.2.5 An open ceiling distribution system is the preferred cable distribution system.

3.2.5.1 An open ceiling distribution system shall not be installed above inaccessible ceiling areas such as lock-in type tiles, drywall or plaster. Suspended ceiling tiles shall be of the removable or lay-in type and located a maximum of 11'0" above the floor whenever possible.

3.2.5.2 Where the cable pathway will be routed above an inaccessible ceiling, metallic conduits shall be installed between accessible areas of the ceiling with no more than two, 90-degree bends. If additional bends are required, a junction box with access panel in the ceiling shall be provided. Coordinate Access Panel locations and sizes with architect. Conduits shall align as closely to the Cable Tray or other cable support above the accessible portion of the ceiling.

3.2.5.3 Under no circumstances may unsupported telecommunications cables lay on top of ceiling tiles, pipes, ductwork, or other above ceiling structures.

- 3.2.6 Adequate and suitable space shall be available in the ceiling area for the distribution system. Mechanical systems (i.e. HVAC, sprinkler, etc.) shall be located as high as possible above the finished ceiling to provide space for the data/telecommunications pathways. Coordination between design disciplines during building design is critical to avoid conflicts. Utilize three-dimensional design tools (i.e. BIM) to facilitate coordination, including Clash Detection or other method to identify conflicts prior to construction.
- 3.2.7 A minimum of 6” of clear space all around the cabling pathways shall be clear accessible space not required for the removal of tile, light fixtures or service and access to other systems.
- 3.2.8 An effective design of a building’s Horizontal Distribution System should meet the following criteria:
- a. Comply with all applicable local, state, and federal codes.
  - b. Comply with all applicable BICSI, ANSI/TIA, UL, NEC, FCC standards and codes.
  - c. Provide flexible cable distribution to workstation locations.
  - d. Facilitate ongoing maintenance.
  - e. Easily accommodate future changes in equipment and services.
  - f. Minimize occupant disruption when horizontal pathways and spaces are accessed.
- 3.2.9 The horizontal distribution system must be designed to handle all types of communications cabling (i.e., UTP, Coax, and Fiber Optic). When determining the type and size of the cable pathway, consider the quantity and size of the cables that the pathway is intended to house, and allow for growth of the area served over the planning cycle.
- 3.2.10 When designing the horizontal distribution system it is important to consider adds, moves, and changes, and minimal disruption to immediate occupants.
- 3.2.11 For new construction or major renovation projects where ready access to the roof is available, a minimum of one (1) 4” conduit shall be routed to the roof of the building from the MDF to be used for routing of antenna and other communications services into the building (i.e. Satellite, DAS, Wireless Bridge, etc.).

- 3.2.11.1 Location of roof penetration shall be coordinated with Architect and other design disciplines.
  - 3.2.11.2 Conduits to be terminated on roof to weatherproof junction box. All penetrations into junction box to be properly sealed to maintain weatherproof rating.
  - 3.2.11.3 If a mast or other structure is required, the wind and ice loading of the mast must be coordinated with the structural engineer in accordance with TIA-222 Rev. G (or most current version).
  - 3.2.11.4 Conduit to extend to MDF Room with grounding bushing bonded to the TMGB.
- 3.2.12 Grounding and Bonding
- 3.2.12.1 Horizontal Pathways must be grounded and bonded in accordance with the requirements specified in ANSI/NFPA 70 and Section 7 of this document, except where other codes or local authorities impose more stringent requirements.
- 3.2.13 Firestopping
- 3.2.13.1 All horizontal pathways that penetrate fire rated barriers must be stopped in accordance with applicable codes.
- 3.3 Conduit Types
- 3.3.1 Galvanized rigid steel conduit and Intermediate Metal Conduit shall be zinc-coated steel conforming to industry standards and specifications. GRC/IMC conduits shall be used in wet or damp environments, or in environments with a high level of vibration.
  - 3.3.2 Intermediate Metal Conduit shall be zinc-coated steel conforming to industry standards and specifications and as manufactured by Allied Tube & Conduit Corp., Triangle/PWC, Inc., or approved equal.
  - 3.3.3 Electrical Metallic Tubing shall be zinc coated steel conforming to industry standards and specifications and as manufactured by Allied Tube & Conduit Corp., Republic Steel Corp., Triangle/PWC, Inc., and Wheatland Tube Co.
  - 3.3.4 Non-metallic conduit shall be composed of polyvinyl chloride, Schedule 40 suitable for 90 C conductors, conforming to industry standards and specifications and as manufactured by Carlon or approved equal. Provide sunlight resistant conduit where exposed.
  - 3.3.4.1 Conduit, fittings and cement shall be produced by the same manufacturer, who must have had at least 5 years of experience in manufacturing the products.
  - 3.3.4.2 Flexible conduit shall be galvanized, spiral wrapped metallic conduit or liquid-tight flexible metal conduit as herein specified.
  - 3.3.4.3 All conduits are to be reamed and bushed.

### 3.4 Conduit Installation

#### 3.4.1 Distribution

- 3.4.1.1 Horizontal conduit system consists of conduits radiating from the accessible ceiling in rooms or corridors to the workstation outlets in the floor, walls, and columns of a building.
- 3.4.1.2 Telecommunication outlets shall be with a minimum 1-inch ID continuous Electrical Metal Tubing (EMT) conduit provided to the accessible ceiling.
- 3.4.1.3 Conduits shall be provided with a bushing at cable exit point.
- 3.4.1.4 Conduits shall be placed in the straightest run possible with no more than the equivalent of two (2), 90° bends per run. Refer to the latest edition of the BICSI TDMM for information on conduit sizing and routing.
- 3.4.1.5 All conduits shall be equipped with a contiguous length of plastic or nylon pull string with a minimum rating of 200 lbs. (90 Kg) or a 12 AWG wire. Secure pull line at each end to prevent it from slipping back into raceway.

#### 3.4.2 Routing of Conduits

- 3.4.2.1 Conduit runs should be designed in the most direct route, parallel to building lines, with no more than two (2), 90 degree bends between pull points or pull boxes, and contain no continuous sections longer than one hundred feet (100') without pull points or pull boxes installed.
- 3.4.2.2 It is recommended that conduit runs be kept to no more than 150 ft. in total length including sections through pull boxes.

#### 3.4.3 Conduit Bend Radii

- 3.4.3.1 The radius of a conduit bend must be at least 6 to 10 times the diameter of the conduit.
  - a. 2 inch (53mm) trade size and less - 6 times conduit diameter.
  - b. 2-1/2 inch (63mm) trade size and larger - 10 times conduit diameter.
  - c. Conduits for fiber optic cabling - 10 times conduit diameter.
- 3.4.3.2 Conduits designated for FutureFLEX tubing must be installed with a minimum bend radius of 12 times the diameter of the conduit.

#### 3.4.4 Conduit Entering Telecommunications Rooms

- 3.4.4.1 Horizontal distribution conduits entering a Telecommunications Room should terminate near the corners and allow for proper cable racking. If conduits are entering through the floor, they must terminate four (4) inches above the finished floor.
- 3.4.4.2 If conduits are entering through a wall, the conduits must be reamed and bushed, and terminated as close as possible to the terminating rack or wall.

### 3.5 Pull Boxes

3.5.1 Provide pull boxes each time raceway installation exceeds a 100 foot (30M) section or a total of 180 degrees in bends and offsets between pull boxes. Do not install a pull box in lieu of a conduit bend. Align the corresponding conduits on opposite sides of pull box with each other.

3.5.2 Pull boxes shall be sized according to the following table:

Minimum Space Requirements in Pull Boxes Having One Conduit  
Each in Opposite Ends of the Box

MAXIMUM TRADE SIZE OF CONDUIT IN INCHES	Size of Box			FOR EACH ADDITIONAL CONDUIT INCREASE WIDTH
	Width	Length	Depth	
21mm (0.75 in.)	102 mm (4 in.)	305 mm (12 in.)	76 mm (3 in.)	51 mm (2 in.)
27 mm (1.0 in.)	102 mm (4 in.)	406 mm (16 in.)	76 mm (3 in.)	51 mm (2 in.)
35 mm (1.25 in.)	152 mm (6 in.)	508 mm (20 in.)	76 mm (3 in.)	76 mm (3 in.)
41 mm (1.5 in.)	203 mm (8 in.)	686 mm (27 in.)	102 mm (4 in.)	102 mm (4 in.)
53 mm (2.0 in.)	203 mm (8 in.)	914 mm (36 in.)	102 mm (4 in.)	127 mm (5 in.)
63 mm (2.5 in.)	254 mm (10 in.)	1067 mm (42 in.)	127 mm (5 in.)	152 mm (6 in.)
78 mm (3.0 in.)	305 mm (12 in.)	1219 mm (48 in.)	127 mm (5 in.)	152 mm (6 in.)
91 mm (3.5 in.)	305 mm (12 in.)	1372 mm (54 in.)	152 mm (6 in.)	152 mm (6 in.)
103 mm (4.0 in.)	381 mm (15 in.)	1524 mm (60 in.)	203 mm (8 in.)	203 mm (8 in.)

NOTE: Width is measured perpendicular to conduit orientation. Length is measured parallel to conduit orientation.

- 3.5.3 Pull boxes with covers over 20 inches (508 mm) shall have piano hinged covers with padlocking capability. Covers over 20 inches (508 mm) wide shall be split bulkhead type with piano hinges located on the long sides. Provide doors where one door is able to be secured to the pull box while the other is able to swing free.
  - 3.5.4 Locate pull box so it is accessible and covers can be opened at least to 90 degrees. Where above ceiling or behind access door center pull box in access door or ceiling tile opening
  - 3.5.5 Pull boxes shall be securely mounted to building structure.
  - 3.5.6 Grounding continuity shall be assured throughout raceway and pull box installation equal to electrical power raceway installation.
  - 3.5.7 Junction boxes shall be constructed of code gauge galvanized sheet metal, of not less than minimum size required by the Electrical Code or other applicable Specification "Standards" and shall be furnished with screw fastened covers. Boxes exceeding 48 inches (1200mm) in any direction shall be properly reinforced with angle iron stiffeners.
  - 3.5.8 Junction boxes to be installed in normally wet location areas shall be of the cast type with threaded hub and gasketed cover plate. The cast pull and junction boxes shall be manufactured by Crouse-Hinds, Appleton, Russellstoll, or approved equal.
- 3.6 Cable Tray Systems
- 3.6.1 General Information
    - 3.6.1.1 Properly installed and coordinated cable trays in the primary cable paths for Category 6 and Category 6A data cabling are critical for cable and network performance.
    - 3.6.1.2 In the Design Development and Construction Document Phase, the Architect and the MEP engineers shall carefully design and coordinate the cable tray paths and clearances to avoid elevation changes and transitions of the continuous path. Careful consideration in the Design and Construction Document Phases must be given to the space within the ceiling plenum so that HVAC ducts, piping, and equipment do not interfere with the cable tray paths.
    - 3.6.1.3 In the Contract Documents phase, the Architect shall require a coordination submittal to ensure that plan and section drawings are submitted and reviewed to insure a continuous uninterrupted cable tray installation fully coordinated with HVAC systems, ducts, sprinklers, piping, and electrical work. The Architect shall provide a copy of this reviewed submittal to the Owner's representative along with a letter verifying that this submittal has been approved and coordinated and furnished to the Contractor for coordination during the Contract Administration Phase of the work.

- 3.6.1.4 Cable tray systems are used primarily as main corridor distribution apparatus. Cable tray system recommended for use in plenum areas above dropped ceilings in corridors of newly constructed and renovated buildings.
  - 3.6.1.5 Cable wireway system is not required in all corridors. It is left to CSCU discretion to decide if application warrants the cost of the cable tray system.
  - 3.6.1.6 Cable wireway systems should be designed as equipped to support only telecommunications and data communications cable. Other low voltage systems may be placed in the wireway system if the disparate systems are properly separated with physical barriers.
  - 3.6.1.7 Shared systems with power are not acceptable under the guidelines listed in avoiding EMI.
  - 3.6.1.8 Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters, covers, and bonding.
- 3.6.2 Acceptable Cable Tray Systems
- 3.6.2.1 The tray shall be wire basket style.
  - 3.6.2.2 A wire basket tray shall be U shaped and constructed of round wire mesh. The basket tray shall be hung via the trapeze style or wall-mounted.
  - 3.6.2.3 Cable tray system must not be center hung.
- 3.6.3 Routing of Cable Tray
- 3.6.3.1 Cable tray systems should be installed with a minimum of bends. If more than three (3), 15 degree turns are installed in a contiguous length, then de-rate the effective capacity of the cable tray by twenty five (25) percent.
  - 3.6.3.2 Delineations in a level cable tray installation are often unavoidable; however, these delineations should be kept at a minimum, with each delineation not exceeding 30 degrees and 24 inches offset. The total delineation for the tray span should not exceed 180 degrees.
  - 3.6.3.3 The cable tray system shall support unbalanced load without tilting.
  - 3.6.3.4 Use end-of-tray cable waterfalls where wire drops down to prevent abrasions and cuts from metal tray edges.
- 3.6.4 Cable Tray Size and Capacity
- 3.6.4.1 Cable tray size and capacity shall be determined by the amount and type of cable, the static load capacity of the tray, and the length of the support span.
  - 3.6.4.2 Cable tray systems should be designed to accommodate 100 percent future growth.
- 3.6.5 Cable Tray Installation Clearance
- 3.6.5.1 Cable trays containing telecommunication cables shall not contain any pipes, tube or equal for steam, water, air, gas, drainage or any service other than telecommunication.

- 3.6.5.2 It is recommended that the cable tray system be installed with as much clearance as possible from other building facilities, and installed in the lowest most location below all other building facilities but above the ceiling grid, in accordance with ANSI/TIA standards and meeting the following criteria:
  - a. 6 in. clearance from obstructions on both sides.
  - b. 6 in. clearance from obstructions to the top.
- 3.6.5.3 Installation of cable tray pulley systems installed in a solid ceiling environment should provide access points at 20 ft. centers and at any directional deviation greater than 15 degrees and/or 90 degree turns.
- 3.6.6 Cable Tray Entering Telecommunications Rooms
  - 3.6.6.1 It is recommended that cable trays NOT be used as a method of passing through walls into the Telecommunications Rooms. The recommended method is to stop the cable trays at the wall and provide the appropriate number of 4” sleeves through the wall, continuing the pathway in the Telecommunications Room with Ladder Racks to the terminating rack or wall. However, if a cable tray is to be used to enter a Telecommunications Room through a wall, the cable tray should be terminated as close as possible to the terminating rack or wall, and the wall opening be properly firestopped with a mechanical firestop system.
- 3.7 Cable Hangers
  - 3.7.1 General Information and Installation Practices
    - 3.7.1.1 Installation and configuration shall conform to the requirements of the ANSI/TIA Standards 568-C.0 and ANSI/TIA-569-D, NFPA 70 (National Electrical Code), and applicable local codes.
    - 3.7.1.2 Cable Hangers shall be spaced every 3’-5’.
    - 3.7.1.3 Refer to manufacturer specifications for the maximum capacity of Category-6 and Category-6A cables (both UTP and STP) allowed per support.
    - 3.7.1.4 The appropriate type of support must be utilized based on the quantity and weight of cables being supported.
  - 3.7.2 Adjustable Fabric Cable Support
    - 3.7.2.1 In the areas along the corridors, where the cable tray cannot be used, and cables are required to be run “free-air”, flexible cable wrap systems shall be used.
    - 3.7.2.2 Cable support straps shall be attached to 3/8” threaded rod. The rods shall be secured to the building structure and be spaced a maximum of 4’ apart. The cable support straps shall be flexible and shall hold up to 100, four-pair UTP cables.
    - 3.7.2.3 The cable support straps shall feature simple locking and unlocking to allow the addition of cables to pull easily through.
    - 3.7.2.4 Cable support system shall be suitable for air handling spaces (Plenum).
    - 3.7.2.5 Installation and configuration shall conform to the requirements of the ANSI/TIA Standards 568-C.0 & 569-D, NFPA 70 (National Electrical Code), and applicable local codes.



- 3.7.2.6 Cable support system shall be Caddy CAT425 or equal.
- 3.7.3 Cable Hook Systems
  - 3.7.3.1 In the areas where the cables are to be branched out from the main corridors to the workstations or classrooms, cable hook systems shall be used.
  - 3.7.3.2 Cable hooks shall be capable of supporting a minimum of 30 lbs. with a safety factor of 3.
  - 3.7.3.3 Do not install more cables on a “J”-hook than recommended by the manufacturer.
  - 3.7.3.4 Installation and configuration shall conform to the requirements of the ANSI/TIA Standards 568-C.0 & 569-D, NFPA 70 (National Electrical Code), and applicable local codes.
  - 3.7.3.5 Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653 G90. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.
  - 3.7.3.6 Cable hooks for corrosive areas shall be stainless steel, AISI type 304.
  - 3.7.3.7 Cable hooks shall be Eaton (Cooper Industries) series BCH21, BCH32, BCH64, or other manufacture that meets these specifications.
- 3.7.4 Bridle Rings with Saddle
  - 3.7.4.1 Bridge Rings may be used where less than 10 cables are required to be routed above an accessible ceiling.
  - 3.7.4.2 Plastic saddles must be secured to the ring. The use of Bridal Rings without a saddle is prohibited.
- 3.8 Outlet Boxes
  - 3.8.1 General Information and Installation Practices
    - 3.8.1.1 Exposed, surface mounted outlet boxes or outlet boxes installed in normally wet locations shall be of the cast metal type with threaded hubs.
    - 3.8.1.2 Recessed outlet boxes for dry locations shall be of the pressed sheet steel, zinc coated type.
    - 3.8.1.3 Telecommunications outlet boxes should be mounted at least 18”AFF (Above Finished Floor) or even with adjacent electrical duplex services.
    - 3.8.1.4 All conduits entering an outlet box are to be reamed and bushed.
    - 3.8.1.5 Where telecommunications outlet boxes are designated for LED Screens (i.e. Digital Signage), the boxes should be mounted at 84 inches AFF or other height as coordinated with the Architect. Locate outlets boxes for video screens such that when the screen is installed, it does not cover Fire Alarm devices or other wall-mounted devices.
    - 3.8.1.6 Outlet boxes should not be placed back to back in wall-stud cavities.
    - 3.8.1.7 Outlet boxes shall be spaced 6 inches (150mm) minimum from an electrical receptacle. Install outlet boxes in separate stud cavity from electrical wiring.
    - 3.8.1.8 For applications requiring soundproofing, specify the appropriate soundproofing material to be placed around the outlet box.

- 3.8.1.9 Where conditions do not allow for an outlet box with conduit to accessible ceiling to be installed, a low voltage mounting bracket, secured to the gypsum wall with screws, may be utilized (Erico #MPLS / MPLS2 or equal).
- 3.8.1.10 If the cable routing to an outlet box requires passing cables through the cutouts in a steel stud, insulated bushings or grommets must be provided to protect cables. This is applicable to both factory cutouts in the stud and cutouts made in the field.
- 3.8.2 Outlet Box and Conduit Sizes
- 3.8.2.1 Up to two Category-6 cables or one Category-6A Cable:
- Telecommunications outlet boxes installed in drywall, plaster, or concrete block wall must be 4-inch by 2-inch by 2-1/2 inch boxes with 1" conduit from accessible ceiling.
- 3.8.2.2 Up to four Category-6 Cables or three Category-6A Cables:
- Telecommunications outlet boxes installed in drywall, plaster, or concrete block wall must be 4-inch by 4-inch by 2-1/2 inch boxes with 1.25" conduit from accessible ceiling.
  - For single-gang faceplates, a reducing ring shall be provided.
  - Outlet boxes for general use, flush mounted in concrete work and walls in normally dry locations, shall be manufactured by Steel City, Appleton, Raco or approved equal.
- 3.8.2.3 Up to eight Category-6 Cables or up to six Category-6A Cables:
- Telecommunications outlet boxes installed in drywall, plaster, or concrete block wall must be 5-inch by 5-inch by 2-7/8 inch boxes with two 1.25" conduits from accessible ceiling.
  - For single-gang faceplates, a reducing ring shall be provided.
  - '5-Square' outlet boxes for general use, flush mounted in concrete work and walls in normally dry locations, shall be manufactured by Randl #T-55017 or approved equal.
- 3.8.2.4 In applications where Telecommunications cables need to share the same outlet box with Audio Visual or other low voltage cabling, the size of the backbox shall be coordinated among disciplines.
- 3.8.3 Mounting Outlet Boxes Above Counters
- 3.8.3.1 Outlet boxes installed above a counter will meet the following criteria:
- Counter with backsplash – Mount outlet box at least 6 inches above the top of the counter to the center of the outlet.
  - Counter without a backsplash – Mount outlet box at least 12 inches above the top of the counter to the center of the outlet.
  - Outlet boxes for Telecommunications shall be at the same height as outlet boxes for electrical receptacles unless otherwise specified by the Architect.
- 3.8.4 Outlet Boxes for Wall Telephones
- 3.8.4.1 Telecommunications outlet boxes designated for wall telephones should be mounted per ADA.

- 3.8.4.2 8” clearance on either side of the outlet box shall be specified to ensure that when the telephone set is installed, it does not interfere with light switches, thermostats, or other devices in proximity to the telephone.
- 3.9 Perimeter Raceways
- 3.9.1 Provide surface metal raceway system to outlets where cabling cannot be concealed within a wall cavity or other space. No cabling to a Work Area outlet may be installed exposed.
- 3.9.2 Surface mounted raceways shall be of sheet steel with matching covers, galvanized or painted to protect against corrosion conforming to industry standards and specifications. All necessary bends, couplings, connectors, etc., shall be provided.
- 3.9.3 Surface mounted raceways shall be suitable for lay in conductors with connector covers permanently attached so that removal is not necessary to utilize lay in feature.
- 3.9.4 If surface mounted raceways are to be used for both telecommunications and electrical wiring, a dual-channel style raceway with a fixed divider shall be utilized. Coordination of size and style of raceway is to be coordinated between the Architect, Electrical Engineer, and Telecommunications Designer.
- 3.9.5 Interior parts shall be smooth and free of sharp edges and burrs.
- 3.9.6 Surface mounted raceways shall be sized for adequate wire bending radius as required by code and ANSI/TIA standards.
- 3.9.7 Surface mounted raceways shall be as manufactured by Legrand, Panduit, or approved equal.
- 3.10 Floor Boxes / Poke-Throughs
- 3.10.1 Floor boxes and/or Poke-Throughs must have sufficient capacity for both power and data cabling, as well as A/V inputs if required.
- 3.10.2 The appropriate device must be specified based on the floor type (i.e. wood, concrete, etc.) and should be coordinated with the Architect. Finish styles of the device must also be coordinated with the Architect.
- 3.10.3 The device, when installed, must maintain the fire rating of the floor.
- 3.10.4 Devices, when installed, must be flush with the floor surface. Monument-style devices are not allowed unless specifically approved by CSCU.
- 3.10.5 Poke-Through devices must be spaced a minimum of 2 feet on-center apart, and not more than one device per 65 square feet of floor area may be installed in a single span.
- 3.10.6 Acceptable manufacturers include Hubbell, Legrand, FSR or approved equal.
- 3.11 Power Poles
- 3.11.1 Power Poles are only allowed if no other method of delivering power and data to a work area is available.

- 3.11.2 Power Poles, if sharing with power, must be dual-channel to provide proper separation between electrical and low voltage conductors.
- 3.12 Furniture In-Feeds
  - 3.12.1 In open office areas with modular furniture, an in-feed may be required to route data cables into the modular furniture.
  - 3.12.2 If feeding from a wall, provide a conduit (conduit size based on quantity of cables such that 40% fill ratio is not exceeded) from accessible ceiling to a junction box in the wall. From the junction box to the furniture, route a piece of flexible metallic conduit into the furniture system. Spiral Wrap or Loom Tubing may also be utilized.
  - 3.12.3 If feeding from the floor, utilize a floor box or poke-through specifically designed for this purpose (i.e. Legrand Multi-Service Furniture Feed). Location of floor box / poke-through is to be coordinated and dimensioned by the Architect, but must not present a trip hazard, and should maintain the aesthetics of the furniture as much as possible.
  - 3.12.4 Coordinate with the Furniture System manufacturer for the exact method for in-feeding cables into the furniture system.
  - 3.12.5 While the length of the flexible metal conduit is not limited per the NEC when used for other purposes besides lighting, the length of the flexible conduit should be minimized to facilitate routing of cables, and to maintain the aesthetics of the infeed.
- 3.13 Underfloor Pathways
  - 3.13.1 Underfloor Pathways are typically found in Data Centers, however other spaces may have a raised floor.
  - 3.13.2 The use of Cable Tray and J-Hooks as described above is acceptable. All components must be plenum rated.
  - 3.13.3 The appropriate mounting hardware for attaching to raised floor support posts must be specified.

## 4. Outside Plant Telecommunications Pathways

### 4.1 General Information

- 4.1.1 The installation of conduits for inter-building cabling may be required. This shall include, where appropriate, the required conduits as well as spare and empty conduits, all associated manholes, etc.
- 4.1.2 The acceptable means of service entrance to the building is an underground conduit system. All entrance conduits must be a minimum of four (4) inch conduit(s), buried at a minimum of thirty six (36) inches below grade. Building mounted boxes are not acceptable.
- 4.1.3 All outside plant conduit must be PVC, Type "C" or Schedule 40, four inch inner diameter (I.D.). Only non-metallic conduit shall be used, except where otherwise noted in this specification. One inch inner diameter (I.D.) may be used from an emergency phone station drop to a building or a manhole with the CSCU Information Technology department's authorization only.
- 4.1.4 Entrance conduit begins at the designated manhole and ends when terminated in the Building Demarcation Point (BDP) for that structure.
- 4.1.5 The cable routing for the CWDS must utilize the same campus conduits and trenches wherever possible.
- 4.1.6 The Installer shall be prudent in the design and installation of inter-building cabling to fully utilize already in-place individual conduits and to avoid the use of spare conduits. A fully utilized conduit is at its maximum when filled to 40% of capacity.
- 4.1.7 A minimum of two spare and empty four inch conduits must be provided for every new conduit bank.
- 4.1.8 All inter-building runs shall be well marked with a continuous marking strip buried in the same trench as the cable and/or conduit and placed 18" above the cable or conduit.
- 4.1.9 All bend radius will be at least 10 times the internal diameter of the conduit. Prefabricated fittings must be used. Pull boxes or joint boxes must not be used in place of bends.
- 4.1.10 Watertight joints between sections of conduits must be made using PVC solvent cement.
- 4.1.11 All conduits must be encased in concrete; PVC conduit separators must be placed at intervals of approximately three feet and fastened securely. The minimum depth of any conduit in the encasement to any exterior surface of concrete must be six inches.

- 4.1.12 Galvanized, rigid steel conduit must be used where conduit runs cross open ditches, attach to bridges or similar structures. All fittings must be suitable for connection to the PVC conduits. Proper grounding and bonding of these conduits is mandatory and must be specified in appropriate engineering installation plans.
- 4.1.13 All conduits crossing steam lines or running parallel within three feet of steam lines must be four inch fiberglass conduit for at least ten feet on either side of the steam line. All fittings must be suitable for connection to the PVC conduits.
- 4.1.14 Conduits shall be separated from other utilities for safety of personnel and for protection of equipment. There shall be 12 inches of earth between the telecommunications conduits and power or other foreign conduits. When crossing gas, oil, water or other pipes 6 inches of separation are required. Conduit runs parallel to pipes shall be separated by 12 inches of earth.
- 4.1.15 The conduit systems must be gradually sloped sufficient to permit penetrating water to drain towards the manholes. The highest point of each conduit must be at the center of each conduit run. The minimum depth of any conduit run to the ground surface is 24 inches unless otherwise specified and agreed to by the College/University.
- 4.1.16 All unused and spare conduits must be provided with removable conduit plugs for waterproofing and protection from earth and debris. All conduits, used and unused must be equipped with a minimum 200 pound strength pull cord.
- 4.1.17 Four, #4 reinforcing rods must be installed in all concrete encasements where entering buildings. Rods must extend six feet from the building. Tie to the building must be provided. The Vendor may install rigid galvanized steel conduit in place of the reinforced concrete. For either alternative the raceway should slope downward from the building and extend into undisturbed earth.
- 4.1.18 Service entrance conduits entering the building must extend to the BDP. These must be rigid conduits. If pull boxes are required, a #6 AWG ground wire must be pulled to the box from the common building/electrical ground. When transitioning from underground PVC to metallic conduit, a PVC to Rigid Metallic Conduit adapter shall be placed at least 10' from the building foundation wall. The RMC shall enter the BDP/MER and terminate with a grounding bushing bonded to the TMGB.
- 4.2 Manholes
- 4.2.1 Buildings identified to be a demarcation point for outside service providers (Comcast, Frontier, Verizon, Lighttower, etc.), the following apply:
- 4.2.1.1 When a building is not on the property line, a minimum of four conduits from the BDP inside the building to the property line shall be provided. The conduits shall be terminated at a manhole, which shall be positioned as close as possible to the property line. However, the manhole shall be away from traffic conditions and be easily accessible for maintenance.

- 4.2.1.2 Service providers (Telephone Company, Cable Company, etc.) will make the proper tie-in from the underground conduit to the building's conduits in the manhole. The location of the manhole must be coordinated with service provider engineers.
- 4.2.1.3 For campuses with more than one building, a minimum of four additional conduits are required for the CSCU Wiring Distribution System (CWDS). The conduit shall be terminated in the designated manhole and routed to the BDP. If the same manhole is utilized for both the campus CWDS and the outside service providers, a minimum of eight conduits shall be installed.
- 4.2.2 All buildings shall have a minimum of four (4) 4" conduits entering the building. Additional conduits may be required, determined by CSCU IT and/or College/University IT, and will be included in the design. All Outside Plant (OSP) conduits shall terminate in the BDP and in designated manhole.
- 4.2.3 Fiber or copper splices must only occur in manholes or other protected and easily accessible locations.
- 4.2.4 All fiber optic cables shall be pulled through a corrugated innerduct in the conduits. Fabric Innerduct may also be utilized (i.e. MaxCell).
- 4.2.5 New manholes shall be reinforced concrete, cast in place or precast, and a minimum of 6 feet wide by 12 feet long and 6½ feet high. The concrete strength for manhole construction shall be 3600 P.S.I.
- 4.2.6 A PVC water barrier must be installed at each construction point.
- 4.2.7 The maximum distances between manholes must not exceed 600 feet for runs containing an aggregate of 45 degree bend, and must not exceed 400 feet for runs containing an aggregate of 90 degree bend. The Vendor must be responsible for the ability to pull cables in any conduit regardless of the distance limitations between manholes.
- 4.2.8 The manhole entrance, manhole roof, and manhole walls down to a level of at least 12 inches below the roof must be coated with one coat of cold asphalt tar and two coats of hot asphalt tar before backfilling around the manhole.
- 4.2.9 Manhole windows must be sealed watertight where conduits or laterals enter or leave.
- 4.2.10 A standard manhole collar and cover must be located in the exact center of the manhole roof, and flush with the finished grade of the ground, concrete, or asphalt surface.
- 4.2.11 Manholes must not be shared with power facilities. The covers must be physically designated as telecommunications manholes.

- 4.2.12 Joint boxes must be proposed only in cable routes having less than four conduits where no branches are required and must be approved by CSCU IT.
  - 4.2.13 All splice connections in manholes must be in watertight enclosures and sealed according to industry standards. All splices must be re-enterable.
  - 4.2.14 All copper cable sheaths must be bonded together at all splices with a #6 solid copper or equivalent.
  - 4.2.15 Conduit entering service boxes and vaults shall be cut flush with the inside of the box. Voids around conduit, as well as the joints between box sections shall be mortared where appropriate. Terminators shall be used on all thermoplastic boxes. The boxes and vaults shall be free of mud, dirt, and debris.
  - 4.2.16 All vaults and manholes furnished and installed shall be fully equipped with racking, pulling irons, steel ladders, grade rings, adjustable collars, vertical support brackets, frames and covers. Conduits shall be terminated in the lowest knockouts first. The frame and cover shall be adjusted to the final grade.
  - 4.2.17 Conduit terminations in service vaults and manholes shall not be brought into the neck or middle of any sidewall, or within 12" of the top or bottom. No conduits shall be terminated on the bottom of the vault. There should be a 2" separation between ducts as they terminate in the vault.
- 4.3 Installation Guidelines and Requirements
- 4.3.1 The Installer shall provide storage and work facilities for all equipment and personnel used on the project. The College/University can furnish raw acreage but cannot supply finished facilities for use by the installer.
  - 4.3.2 All construction, excavation, and restoration plans for new conduit, ducts, and manholes shall be submitted to and approved by the appropriate CSCU Telecommunications Department, College/University and State of Connecticut departments prior to commencement of work.
  - 4.3.3 The Installer shall protect, replace, or restore to original or better condition any architectural or landscape features of the campus disturbed or altered by any construction.
  - 4.3.4 The Installer shall protect all above and below grade existing utilities. Any damages to existing utilities must be corrected by the Vendor on an immediate, emergency basis. Established cutover dates will not be modified as the direct result of damages, delays or other circumstances. All damages are the sole responsibility of the Installer and the repair thereof shall be at Vendor expense.
  - 4.3.5 The Installer shall immediately remove from the site any debris, including earth, resulting from construction.



- 4.3.6 The Installer shall do any pumping necessary to remove any water from construction areas.
- 4.3.7 The Installer shall repair all damage to building exterior and interior walls, ceilings, foundations, or floors.
- 4.4 Outside Plant Conduit Inside a Building
  - 4.4.1 Design conduits entering from below grade point to extend 4 inches above the finished floor.
  - 4.4.2 Conduits shall be provided with a grounding bushing at cable exit point. Grounding bushing to be bonded to the nearest Grounding Busbar with #6 AWG Ground Wire.
  - 4.4.3 If the conduits enter the building below the finished floor, this is best accomplished by creating a trench for the conduits to enter. The trench must be a minimum of three (3) feet deep and two (2) feet wide.
  - 4.4.4 It is imperative that slope and grade be considered in the design and installation of entrance conduits, ensuring that conduits are sloping away from the building toward the hand hole, thus eliminating drainage problems.
  - 4.4.5 All entrance conduits shall be securely fastened to the building so they can withstand the typical placing procedures by the service provider.
  - 4.4.6 Rubber conduit plugs, a water plug, or duct sealer (depending upon the conditions) shall be used to seal inside-the-building end of a conduit to prevent rodents, water, or gases from entering the building.
  - 4.4.7 The contractor shall reseal conduits after cable is placed in them per 4.4.6 above.

## 5. Telecommunications Spaces

### 5.1 Overview:

5.1.1 This section defines the standards for Telecommunications Spaces, which are the areas used for housing telecommunications/computing equipment and cables. Discussed in this section are Building Demarcation Point, Main Equipment Rooms, and Telecommunications Rooms.

5.1.2 It is strongly recommended that the Telecommunications Spaces be constructed as early as possible in the construction schedule, including buildouts of the rooms (walls, floors, doors, ceiling, paint, plywood, etc.), lighting, UPS and electrical power, cooling, door locks, and all backbone cabling between the rooms. Completion of the Telecommunications Spaces will allow for installation and configuration of networking equipment by CSCU. This networking equipment is required for connection of CCTV cameras, IP Door locks, Access Control panels, Wireless Access Points, Building Management System components, and other devices that will require network connectivity for building Commissioning by individual sub-contractors and/or the Commissioning agent.

### 5.2 Definitions:

5.2.1 The Building Demarcation Point (BDP) consists of equipment (cables, connecting hardware, protective devices, etc.) and areas that terminate outside services into the premises (building, or campus) cabling. Here we would find protective devices that also serve as the demarcation point for outside carriers.

5.2.2 The Main Equipment Room (MER) is the primary communications room for a building or facility. Other common terms or abbreviations used to describe this room are Building Equipment Room (BER), Main Distribution Frame (MDF), or simply Equipment Room (ER).

5.2.3 The Telecommunications Room (TR) is set aside on each floor of a building for the exclusive purpose of housing the communications equipment and related wiring that serves that specific area of the building. Other common terms or abbreviations to describe this space are Satellite Equipment Room (SER), or Intermediate Distribution Frame (IDF).

### 5.3 **PROHIBITED** use of Telecommunications Spaces:

5.3.1 Using any Telecommunications Space (BDP, MER or TR) as a route for other facilities to pass through or above (such as water, drainage, electric, etc.).

5.3.2 Using boiler rooms, air exchange rooms, janitorial closets, electrical distribution closets or areas with water heaters and wet sinks as a Telecommunications Space.

5.3.3 Telecommunications Spaces cannot have any water pipes within the room's interior space, routing horizontally on the floor directly above the room or within the floor slab

- 5.3.4 Lay-in ceilings (Acoustical Ceiling Tiles) in Telecommunications Spaces.
- 5.3.5 Locating non-IT resources in Telecommunications Spaces.
- 5.4 Building Demarcation Point (BDP)
  - 5.4.1 Space Design Criteria
    - 5.4.1.1 Minimum Room Size:
      - a. Small Buildings (serving size of <20,000 Sq. Ft.) – 4' x 5'
      - b. Large Buildings (serving size of <50,000 Sq. Ft.) - 6' x 8'
      - c. If the BDP is co-located within the MER, follow the Space Design Criteria for MER.
    - 5.4.1.2 Location: The BDP room shall be located on the basement or ground floor.
    - 5.4.1.3 Floor Loads: Floors shall be designed to support 4.8 kPa (100 lb. /ft<sup>2</sup>) minimum
    - 5.4.1.4 Door: Rooms shall have a fully opening, lockable door, which is at least 36" wide and 80" in height.
    - 5.4.1.5 Interior Finishes: To minimize dust, floors should be vinyl composition tile or sealed concrete, and all exposed concrete, brick and gypsum board walls should be painted or sealed.
    - 5.4.1.6 HVAC: Rooms shall have HVAC to control temperature and humidity. The heating, ventilating, and air conditioning (HVAC) system shall be designed to maintain an air temperature in the room of between 64°F - 72°F, with a humidity level of 55 - 30%. Design the system for the maximum amount of telecommunication equipment that the room could support.
    - 5.4.1.7 Grounding: Provide a building ground wire, with busbar, to the room. Locate the busbar at the lower left corner of the plywood backboard. The Owner will indicate on which backboard to place the busbar. Refer to the Grounding section of these standards.
    - 5.4.1.8 Lighting: Provide minimum lighting to be equivalent of 540 lux (50 foot-candles) measured 3 feet AFF.
    - 5.4.1.9 Plywood Backboards:
      - a. Three interior walls in the room, excluding the wall which contains the entrance door, should be covered with ¾", void-free plywood. Plywood should be fire-rated or treated with a minimum of two coats of fire retardant white paint on all sides.
      - b. The plywood shall reach from corner to corner. Install the plywood vertically from 6" to 8'6" above finished floor (AFF) and anchored securely to wall substrate with a minimum of five (5) equally spaced fasteners along each vertical edge and down the centerline of each sheet of plywood.
      - c. Fasteners shall be of the appropriate type for each substrate.
      - d. Provide blocking or additional studs in framed walls to receive plywood backup panel fasteners.
      - e. In order to field verify the type of plywood installed, at least one of the legible grade stamps on each sheet of plywood shall be masked or covered prior to painting.
    - 5.4.1.10 Electrical:

- a. On each wall, except the wall containing the door, install two, 120 volt, 20-amp electrical four-plex outlets with a dedicated circuit to each receptacle, evenly spaced, at 102" AFF. Refer to Power section of these standards.
- b. Separate duplex 120V convenience electrical outlets shall be installed (for tools, field test instruments, etc.), which are:
  - i. Located at 18" AFF
  - ii. Placed at 6 ft. intervals around perimeter walls
- c. Isolated power and emergency receptacles shall have a finish color that is distinct from receptacles that are connected to normal power
- d. Note: Project plans may specify the need for additional electrical outlets to be installed, depending on the location of the electrical equipment

5.4.2 If BDP and MER are in separate rooms, the following guidelines for the BDP room shall be met:

- 5.4.2.1 Room should be near or at the point where the facilities enter the building.
- 5.4.2.2 A maintenance clearance of 36 inches is required in front of all wiring or equipment panels.
- 5.4.2.3 Room shall be free of any storage material or other obstructions that could prevent technicians from performing their duties.
- 5.4.2.4 Provide a minimum of 4-4 inch conduits from the BDP to the MER. Provide 50% spare 4 inch conduits.

5.4.3 It is important to note that the BDP might not be located within the Main Equipment Room (MER) and, in these circumstances, the same number and size of the conduit as installed for the service entrance, must be installed between these two locations. It is not unusual for the demarcation point (BDP) to be located in the ground floor and the Main Equipment Room to be located on a higher floor.

5.4.4 All penetrations into fire walls, conduits, and sleeves through floors and cable trays that pass through a fire-rated wall must be properly fire-stopped in accordance with the National Fire Protection Association (NFPA), ANSI/NFPA-70 NEC, Article 300-21, and ANSI/TIA-569-D.

## 5.5 Main Equipment Room (MER)

### 5.5.1 Overview

- 5.5.1.1 The MER is used to distribute communication services to all of the floor Telecommunication Rooms (TR) within the building and, as such, it can be viewed as the center of the star for wiring and cable distribution. The room contains the necessary wiring cross connects, punch down blocks, fiber patching equipment, and other components to connect to each TR within the building.

- 5.5.1.2 Items included in a typical MER are the network racks, file servers, video surveillance cabinet and servers, CATV termination hardware, PA system cabinet, PA termination field, 110 blocks for voice, video communication cabinet, UPS units, conduit sleeve receiving services from outside campus for CATV, WAN fiber, and voice circuits.
- 5.5.2 Space Design Criteria
- 5.5.2.1 MER Room Size:
- a. Main Equipment Rooms should be sized to meet the requirements of the current and planned communications equipment. When the designer/engineer does not know the specific equipment that may be used in an equipment room, the ANSI/TIA-569-D standard recommends that there be a minimum of 0.35 square feet of space for every 100 square feet of workspace. (A minimum of 280 square feet is recommended.)
  - b. The actual size of the MER shall be determined during the design phase of the project when more information, pertinent to the size and application of the building, is available.
  - c. The MER must be a secure room and that disaster backup and continuity plans must be in place for this facility.
  - d. Coordination with the Electrical Engineer is necessary to determine the physical size of the UPS that may be located in the MER. All clearances around electrical equipment per NEC requirements must be adhered to.
- 5.5.2.2 Location
- a. Every building shall have one Main Equipment Room, and the room should be centrally located in the basement or ground floor.
  - b. The MER shall not be located below potential water level unless positive preventative measures against water infiltration are employed. The space shall be free of water, heating or drain pipes not directly required in the support of the equipment within the room. A floor drain with trap and back flow preventer or sump with automatic pump shall be provided within the room if risk of water infiltration exists.
  - c. When selecting the room location within the building, avoid locations that are restricted by building components that limit pathway access or future expansion, such as elevators stairways, outside wall, load bearing walls, utility shafts, ductways, pipe chases, etc. Accessibility for the delivery of equipment to the space shall be provided for.
  - d. Do not locate equipment rooms in places that are subject to the following conditions:
    - i. Water infiltration
    - ii. Steam infiltration
    - iii. High humidity from nearby sources
    - iv. Heat (e.g., direct sunlight)
    - v. Any other corrosive atmospheric or environmental conditions
    - vi. Adjacency requiring access through other secure areas

- e. Shared use of equipment room space with other building facilities must be avoided. Locations which are unsatisfactory for equipment rooms include space in or adjacent to:
  - i. Electrical closets
  - ii. Boiler rooms
  - iii. Washrooms
  - iv. Janitor closets
- f. Space that contain:
  - i. Sources of excessive EMI (i.e. transformers, ballasts, motors, machinery or fan units)
  - ii. Hydraulic equipment or other heavy machinery that may cause excessive vibration
  - iii. Steam pipes
  - iv. Drains
  - v. Cleanouts
- g. The location of the MER can have significant impact on all other aspects of communications system distribution design. In selecting a location, awareness of the spaces immediately adjacent to (i.e., beside, below, and above) the equipment room must be addressed. When designing equipment rooms, the following factors shall be considered:
  - i. Services to be terminated
  - ii. Access and proximity to distribution cable pathways
  - iii. Building facilities and access to the equipment room
  - iv. Telecommunications provider requirements
  - v. Proximity to electrical service and electro-magnetic interference (EMI) sources
  - vi. Space required for equipment
  - vii. Provisions for future expansion
  - viii. HVAC issues

#### 5.5.2.3 Wall Requirements

- a. A minimum of three interior walls in the room should be covered from 6" above finished floor 8 feet up, with ¾", void-free plywood. Plywood should be fire-rated or treated with a minimum of two coats of fire retardant white paint on all sides. In order to field verify the type of plywood installed, at least one of the legible grade stamps on each sheet of plywood shall be masked or covered prior to painting.
- b. The plywood shall reach from corner to corner. Install the plywood vertically and anchor securely to wall substrate with a minimum of five (5) equally spaced fasteners along each vertical edge and down the centerline of each sheet of plywood.
- c. Fasteners shall be of the appropriate type for each substrate.
- d. Provide blocking or additional studs in framed walls to receive plywood backup panel fasteners.
- e. If the Building Demarcation Point (BDP) is located within the room, wall space with backboards must be provided for terminations and related equipment. Due to equipment mounted

on the walls and workspace requirements, this need may have an effect on the three-foot workspace

- 5.5.2.4 Ceiling Requirements
- a. A minimum ceiling height of 10'-0" must be maintained.
  - b. MER rooms shall not have a lay-in or drop ceiling.
- 5.5.2.5 Floor Requirements
- a. Flooring should be sealed concrete, or other finished surface to keep dust at a minimum. VCT tile may also be considered but is not required. Anti-static flooring shall be installed as required by equipment.
  - b. The floor rating under distributed loading must be greater than 12 kPa (250 lb./ft.<sup>2</sup>).
  - c. The floor loading may be concentrated and therefore must be greater than 4.4 M (1000 lbs.) in areas where support for communications equipment, racks, and cabinets is required
- 5.5.2.6 Firestopping
- a. All penetrations into firewalls, conduits, and sleeves through floors and cable trays that pass through a fire-rated wall must be properly firestopped in accordance with the National Fire Protection Association (NFPA), ANSI/NFPA-70, the NEC, ANSI/TIA-569-D and the latest edition of the BICSI TDMM. The manufacturer's recommended installation practices must be followed.
  - b. Each installation of firestopping material must only be used in applications as specified by the firestop manufacturer. When installing additional cabling/wiring, the firestop system must be reevaluated, and if necessary, a new firestop system must be installed to restore the firewall integrity with the appropriate UL-classified system. Only use of UL-classified firestop systems is acceptable.
- 5.5.2.7 Door Requirements
- a. The door shall be at least 3' 6" wide and swing open out of the room wherever possible. If door swing out is not possible, then the room must be enlarged to accommodate the swing such that racks, cabinets, or other equipment does not block the swing of the door.
  - b. The door should lock from outside for access. Where available, the door to the MER shall be equipped with a proximity card reader connected to the building Access Control System, door contacts to provide door status, and Request to Exit sensor or button as required.
  - c. The door to the MER shall not be located at the center of the front wall. Place the door at the outermost end of the corridor side of the MER.
- 5.5.2.8 Grounding
- a. MER shall have a ground bus and meet all requirements of NECA/BICSI 607-2011 Standard for Bonding and Grounding Planning for commercial Buildings. Refer to Section 8 of this standard for Bonding and Grounding Requirements.

- b. A grounding system must be designed. The system must provide a short, low-resistance path to ground from all conductive surfaces. Follow Grounding and Bonding as outlined in Section 8 of this document.

#### 5.5.2.9 Fire Protection

- a. The Main Equipment Room and Telecommunications Rooms are critical elements of the communication and emergency system of the College/University. It is essential to protect both the facility and the equipment delivering communication services.
- b. Pipes must be insulated to prevent water condensation from forming and possibly damaging telecommunications equipment. Fire suppression system pipes shall not be installed directly over equipment, but rather they shall be placed near the walls with the manifold pipes in ceiling corners.
- c. Fire protection for the MER and/or Telecommunications Room(s) containing equipment in addition to network switches and routers (e.g. computer servers, security systems, network storage devices, etc.) shall be achieved by a combination of a pre-action sprinkler system and a clean agent fire suppression system.  
Notwithstanding the foregoing, rooms containing only network switches and routers need not comply with the above.
- d. Where more than one telecommunication space is involved that requires a clean agent fire suppression system as identified above, each telecommunication space shall be protected by an individual system. Multiple areas remote from each other shall not be served by a single interlock pre-action / clean agent system.
- e. The fire protection systems shall comply with the requirements of the Connecticut State Building Code and Fire Code and the referenced editions of NFPA 13, NFPA 70, NFPA 72 and NFPA 2001.
- f. The single interlock pre-action and clean agent systems shall both be controlled by a single control panel with dual release capability. System release shall be activated by a combination of cross zoned ionization and photoelectric smoke detectors in alarm or by a high sensitivity smoke detection system as determined most appropriate by the consultant. System control shall also include manual release, system abort and service bypass functions.
- g. The single interlock pre-action and clean agent control panel(s) shall be interfaced with the building fire alarm system to relay system trouble and alarm conditions to the building fire alarm system.
- h. Smoke detection shall be provided within all areas served by the protection systems including any plenum spaces within the telecommunications room protection envelope.
- i. The consultant shall coordinate location of storage tanks, control panels and pipe routing with the telecommunication equipment layout in order to minimize interference with room equipment. Coordinate the location of fire protection system components with



- room ductwork and lighting. Route system pipes over foot traffic areas and avoid installing piping directly over telecommunication equipment.
- j. The consultant shall specify that the installer shall provide a shop drawing submittal indicating, but not limited to, the following:
    - i. The sequence of operation of the detection and release equipment
    - ii. The internal control panel wiring diagram
    - iii. Scaled installation drawings at not less than 1/8" scale showing: storage tanks, control panels, agent nozzles, sprinklers, piping, smoke detectors, manual pull stations, abort switches, and audible/visual alarms
    - iv. Manufacturer's literature on all specified equipment
    - v. Hydraulic calculation data
  - k. Where existing telecommunication spaces are to be modified, any existing wet sprinkler piping shall be removed and replaced with a single interlock pre-action sprinkler system.
  - l. The clean agent system shall be a total flood system utilizing Novec1230, commonly known by the trade name Sapphire. The system shall be designed to provide the required agent discharge in 10 seconds or less and maintain the required design concentration within the protected space for a minimum of 10 minutes.
  - m. Sizing of the clean agent system piping system shall be performed by the installer utilizing clean agent manufacturer's UL listed software and in accordance with NFPA 2001.
  - n. The design concentration of the clean agent within the protected space shall equal or exceed the manufacturer's current recommendation for a Class C electrical fire. The design concentration shall not exceed the NOAEL value stated in NFPA 2001.
  - o. The consultant shall coordinate electrical power shutdown of equipment within the protected space with the electrical engineer.
  - p. The consultant shall coordinate with the architect the required sealing of the room to properly maintain the required clean agent discharge concentration. Spaces protected by the clean agent system shall be properly sealed by the appropriate use of door sweeps, self-closing doors, painting of porous walls; and sealing of all holes, cracks, and penetrations. Where possible, walls for the protected space are to extend up to deck.
  - q. All ductwork within the space shall be properly sealed. Ducts with inlets or outlets to the protected space shall be provided with dampers to provide a 100% duct closure to the space prior to clean agent system discharge. Consultant shall coordinate with the HVAC engineer to ensure such function is provided.
  - r. The design specifications shall require the installing contractor to provide a room fan test as described in NFPA 2001, Annex C to verify the proper sealing of the protected space.

#### 5.5.2.10 Mechanical System Requirements

- a. The MER heating, ventilating, and air conditioning (HVAC) system shall be designed to maintain an air temperature in the room of between 64°F - 72°F, with a humidity level of 55 - 30%. If the room is to be regularly occupied, ventilation air is required meeting the International Mechanical Code.
- b. Design the system for the maximum amount of telecommunication equipment that the MER could support. Coordinate with CSCU for equipment requirements so that heat load estimates can be calculated.
- c. Cooling in the MER is critical to the operation of the network electronics and shall be maintained continuously 24x7x365. Each telecommunications room shall have an independent environmental system that is neither part of nor dependent upon building HVAC.
- d. Telecommunications room HVAC systems shall derive power for operations from emergency or backup generator systems in the event of power loss to the building (NOT the UPS).
- e. The cooling and heating system within the MER shall remain independent of the building automated systems and/or building automatic shutdown system, if any, and shall not be subjected to building power-saving shutdowns (evenings, weekends, and holidays). Provide continuous dedicated environmental control (24 hours per day, 365 days per year).
- f. Telecommunications rooms shall maintain a positive pressure with a minimum of one air change per hour.
- g. Where ever possible, HVAC system is to be located outside the MDF/IDF room and appropriate cooling feed ducts and return ducts entering and exiting the room. HVAC equipment located inside MDF/IDF rooms may be either floor mounted, wall mounted or suspended from joists or building structure above. If the HVAC equipment is suspended from above, the minimum clearance shall be 10'0". HVAC equipment including lines shall not be located over or above telecommunications equipment.
- h. Ductwork for HVAC systems within the Telecommunications Room shall be run so that it will not eclipse trays nor block access to other equipment.
- i. Supply diffusers shall be placed in front of equipment cabinets and/or racks, and returns placed at the rear of equipment cabinets and/or racks to create a "hot aisle – cold aisle" configuration.
- j. The temperature display for the MER shall be mounted above lighting switches next to the entry door. Temperature will be controlled digitally through the building automation system.
- k. Where water-based HVAC systems are utilized, water lines and coils shall not be located over planned communications equipment locations.
- l. Condensate lines shall drain to building exterior, or sanitary drain line, without use of condensate pump. Evaporator unit shall include secondary drain pan (provided it does not interfere with

the unit airflow) with float switch designed to shut off unit in the event of overflow. Floats switches shall be UL 508 listed.

- m. Provide the ability for BMS (where provided) to remotely monitor temperature and humidity and alarms.

#### 5.5.2.11 Electrical System Requirements

- a. All new construction and major renovations shall include both a UPS system and backup generator to support the Telecommunications Rooms. The physical size of the UPS must be accounted for in MER/TR room layout. All required clearances around the UPS must be adhered to.
- b. Each MER shall be wired for a UPS system with transient voltage surge suppression (TVSS) protection device. The size of the UPS system will be determined on a project by project basis. A transfer switch will provide a feed to the UPS system and will receive its feed from two sources: the building's main power distribution panel; and a backup telecommunications generator.
- c. The centralized UPS system will feed an electrical distribution panel in each telecommunications room (MER/TR). The distribution panels will be sized on a project by project basis with a minimum size to accommodate four dedicated 30 amp, 2 pole circuits with 100% expansion space. Individual rack-mounted UPS units in each TR are not permitted unless approved by CSCU. Features of the centralized UPS shall include the following:
  - i. Provide clean, uninterrupted power to MER/TR Room equipment including but not limited to network switches, servers, security equipment, etc. UPS shall also protect against spikes, surges and sags from utility power sources.
  - ii. UPS shall be scalable. Provide N+1 redundancy for reliability and future growth. UPS to be online type, double conversion.
  - iii. The UPS shall be sized for 150% of the anticipated load to allow for future capacity.
  - iv. If a generator is installed and supports the MER/TR UPS, runtime must be sufficient to allow the generator to become fully operational. If no generator, the UPS runtime must be a minimum of 30 minutes.
  - v. A full wrap-around bypass shall be provided.
  - vi. UPS shall be equipped with a network management card for connection to the CSCU network for remote monitoring. Additionally, the UPS shall have the capability to connect to the Building Management System.
  - vii. Based on the type and quantity of batteries, provide hydrogen gas detection and ventilation per code requirements. System shall be connected to Building Management System. VRLA type batteries typically do not require ventilation, but must be confirmed with UPS manufacturer.

- d. All electrical equipment in the MER/TR Rooms, (including electrical panels, UPS, disconnect switches, etc.) must not be located below any sources of water (i.e. sprinkler pipes, water pipes, air conditioner units, etc.). All clearances required per NEC must be adhered to.
- e. Each Active Equipment Cabinet/Rack (housing servers, network equipment, video surveillance, etc.) shall be equipped with electrical receptacles to accommodate the equipment located in the rack. Receptacles may include Quad 5-20R, L5-20R (20A/120V Twist-Lock), L6-20R (20A/208V Twist-Lock), L5-30R (30A/120V Twist-Lock, or L6-30 (30A/208V Twist-Lock).
- f. Each receptacle may require a dedicated circuit, but should be coordinated with equipment loads and CSCU. Active equipment may be equipped with multiple power supplies that will require individual receptacles.
- g. Receptacles for equipment racks shall be located on the ladder rack above each equipment rack wherever possible.
- h. **Electrical Engineer shall coordinate with Structured Cabling System Designer, CSCU IT and Owner for quantity and location, and mounting height of receptacles for each specific telecommunication room layout.**
- i. Cover plates for surface mounted boxes in Telecommunication Room spaces shall be raised cover galvanized steel manufactured for the purpose.
- j. Cover plates shall be identified with panelboard designation on top and circuit number below engraved or silk screened.
- k. Environmental alarms must meet state, federal, codes and be interfaced to the College/University card access/alarm panels. Panel inputs include all UPS alarms; generator active alarms; fire, temperature, humidity, A/C unit transition switch; floor water detection; battery damper; and door breach.

#### 5.5.2.12 Lighting Requirements

- a. MER shall have adequate and uniform lighting with a minimum of 50-footcandles (540 lux) at 3 feet (910 mm) above floor level. (Take into account the light loss due to the full cable tray and light that may be blocked by equipment cabinets when performing the lighting calculations.)
- b. Coordinate positions of the light fixture with the equipment layout, particularly overhead cable trays and equipment cabinets, to ensure the light is not obstructed.
- c. Use high efficacy LED fixtures. Light fixtures shall be properly secured to the ceiling.
- d. LED fixtures shall be bi-level switching type, low level shall be at the 50% light output and the high level shall be full light output.
- e. Install lighting fixtures at a minimum of 8'-6" above the finished floor. Locate lighting fixtures to maintain minimum ANSI/TIA distance requirements between lighting fixtures and all telecommunications cabling and equipment. Coordinate locations of lighting fixtures in order to provide adequate lighting (without

shadows) for personnel working on or around telecommunications equipment. Locate in front and rear of cabinet/rack aisles.

- f. Provide a minimum equivalent of 540 lux (50 footcandles) measured 3'-0" above the finished floor.
- g. Emergency lighting is recommended within telecommunications rooms.
- h. Provide emergency lighting in the MER consistent with the emergency lighting system for the building.

#### 5.5.2.13 Cable Management

- a. Overhead cable management must be given careful consideration during planning stages of construction.
- b. At a minimum, all communication spaces should have Ladder Rack installed at a height of ninety-six (96) inches off the floor, with minimum width of 12".
- c. Locate the Ladder Rack on the perimeter walls of the MER with the Ladder Rack providing access to equipment racks. Radius Drops (cable Waterfalls) shall be installed on Ladder Rack to maintain proper bend radius of cabling.
- d. All cable wireways shall be UL approved for use with communication cabling.

#### 5.5.2.14 Conduits and Sleeves

- a. Riser and distribution cables leaving the room to building TRs should be via cable tray, four-inch (4") conduits, sleeved cores, or fire-rated assemblies (i.e. STI EZ-Path Sleeves).
- b. The exact number of conduits required or size of the cable wireway should be determined based upon the amount of fiber and copper cable that must be supported in each Computer Room or Telecommunications Room.
- c. Additional conduits or sleeved cores must be included in the design to provide for future growth.
- d. If the Building Demarcation Point (BDP) is not located within the MER, sufficient conduit must be run between these two locations. Additional cores/conduits must be provided for future growth.
- e. All conduits/coring should be kept six inches (6") or less from walls whenever construction permits.
- f. All penetrations must be sealed with smoke and firestops, which meet applicable code.
- g. Pull string must be installed in all conduits.
- h. Provide a minimum of four (4), 4 inch conduits from the MER to each TR. If the MER and TRs are stacked, sleeves are acceptable. Provide 50% spare 4 inch conduit/sleeves. (This means that if four, 4" conduits/sleeves are provisioned for use, there must be an addition two, 4" spare conduits/sleeves installed for future growth, for a total of six 4" conduit/sleeves.)
- i. If armored backbone cables are specified, the use of conduits between the MER and TR are not required. Armored cables must be properly supported on Cable Tray, J-Hooks, or other approved cable support method.

- 5.5.2.15 Additional MER Design Considerations
- a. The layout of major communications equipment in the MER must facilitate the effective routing of power and communications cabling. The Main Equipment Room must provide adequate space for:
    - i. Server rack(s)
    - ii. Network equipment rack(s)
    - iii. Cable rack(s)
    - iv. Video surveillance equipment rack(s)
  - b. In addition to space for communications requirements, an equipment room also shall include space for necessary environmental control equipment, power distribution/conditioners, and UPS systems that may be installed.
  - c. When designing equipment rooms, consider incorporating building information systems other than traditional voice and data communications systems (e.g., CATV distribution systems, alarm and security systems, and audio/paging systems). In some instances, the MER (equipment room) may also serve as the entrance facility for the building communications.
  - d. The design of a new equipment room should begin with an assessment that considers each of the factors listed below. The information gathered from this assessment must be considered by the engineers/designers at all stages of the project design, along with guidelines and requirements of applicable local, state, federal standards and this design document. The following design factors shall be considered:
    - i. College/University requirements
    - ii. CSCU System requirements
    - iii. Telecommunications pathway locations
    - iv. Service provider (Local Exchange Carrier [LEC]) requirements
    - v. Environment/Facility conditions and resources
  - e. The designer shall make provisions for access to equipment for maintenance and administration as well as for future growth. NEC Section 110.26 requires three (3) feet of clear working space around equipment with exposed live parts. This applies to communication equipment rooms.
- 5.6 Telecommunications Room (TR)
- 5.6.1 Overview
- 5.6.1.1 The equipment in the TR includes wiring cross connects and patch panels, punch down blocks, fiber patching equipment, etc. The TR also contains communications equipment such as routers and switches where applicable.

- 5.6.1.2 While the MER serves as the communications hub for the entire building, the TR serves as the center of the star for wiring and cable distribution for that floor (or portion of the floor). Wiring from the TR is distributed to each work space served by that TR; this wiring can be distributed via a number of methods depending upon building and electrical codes, fire safety codes, etc. The most common methods are cable tray systems, cable suspension (above a dropped ceiling), conduits and various under floor systems.
  - 5.6.1.3 The cable distance between the TR and any workspace must be less than 295 feet of measured cable length.
  - 5.6.1.4 Design and engineering standards for the MER as specified previously in this document detailing specifications on: Power/UPS, HVAC, Fire Alarm, Security, Cable Management, and Electrical Systems, apply to TR design as well.
  - 5.6.1.5 There will be one or more TRs depending on the size and layout of a floor. The TRs should be located so that it is easy and straightforward to run cable to each location served by that TR without having to penetrate or pass around architectural barriers.
  - 5.6.1.6 Telecommunications communications rooms should be dedicated spaces located on every floor and be vertically stacked with hallway or public area access. They should be strategically located to serve a maximum of 20,000 SF of building floor space and limit maximum horizontal cabling runs to 90 meters (295 feet).
  - 5.6.1.7 The rooms should be sized to optimize their ability to accommodate known requirements of specific equipment to be installed allowing for a minimum of 100% future expansion, and the ability to accommodate change and to be as unconstrained as possible by vendor equipment and media requirements.
- 5.6.2 TR Room Size
- 5.6.2.1 TRs vary in size depending on their function, concentration of telecommunication outlets and the size of the floor area they serve. The actual size of TR will depend on the building and therefore will require input from CSCU during the design phase of the project. However, the room must be rectangular in shape, and the minimum size of a TR should not be less than 9' x 10'.
  - 5.6.2.2 **Telecommunications rooms that meet the square foot requirements but have jogs in the floor plan or structural elements such as columns that interfere with the equipment layout do not meet these requirements.**
- 5.6.3 Location
- 5.6.3.1 TRs should be located so that it is easy and straightforward to run cable to each location served by that TR without having to penetrate floors or pass around architectural barriers.
  - 5.6.3.2 It is imperative that TRs be located so as to minimize cable lengths for both horizontal and vertical cable runs.

- 5.6.3.3 Vertical Distribution - When designing Telecommunications Rooms for vertical distribution, it is preferable to "stack" rooms so that the Telecommunication Room on level one is located directly below the Telecommunications Room on level two, etc. Rooms should be connected to one another via four, (4) inch conduits. Conduits should penetrate the floor in the room on the far left corner of the room, and extend no less than six (6) inches above the floor.
- 5.6.3.4 Horizontal Distribution - Telecommunication Rooms must be located to maintain a distance no greater than 295 feet (cable length) from the furthest termination point (communication outlet) served by that room. Ensure that conduits and cable trays feeding the Telecommunication Room terminate completely inside the room.
- 5.6.4 Walls, Floors, Ceiling, Door Requirements
  - 5.6.4.1 Requirements for the Telecommunications Room (TR) shall follow the same guidelines as the MER.
- 5.6.5 Fire Protection Requirements
  - 5.6.5.1 Requirements for the Telecommunications Room (TR) shall follow the same guidelines as the MER.
  - 5.6.5.2 Fire protection sprinklers should only be provided in telecommunications rooms if required by code or local jurisdiction. The preferred system type is a double interlock system installed in the MDF only. If sprinkler heads are provided, install wire protective cages to prevent accidental operation. For wet pipe systems, provide drainage troughs, where applicable. Provide as required by code or local jurisdiction.
  - 5.6.5.3 Fire alarm sensing devices (smoke and thermal detectors) connected to the building's fire alarm system is the preferred method of fire protection. Provide as required by code or local jurisdiction.
- 5.6.6 Mechanical, Electrical and Lighting Requirements
  - 5.6.6.1 Requirements for the Telecommunications Room (TR) shall follow the same guidelines as the MER.
  - 5.6.6.2 Additional Electrical Requirements:
    - a. When designing electrical system for TRs, an engineer shall assume that the Owner will install in the room Power over Ethernet (PoE/PoE+) data switch(es). Current and emerging PoE standards define the following per port wattages that must be considered when calculating the TR electrical requirements.
      - i. 15.4W (12.95W at end device) per 802.3af.
      - ii. 30W (25.5W at end device) per 802.3at.
      - iii. 55W per proposed 802.3bt.
      - iv. 90-100W per proposed 802.3bt.
    - b. The most current version of the National Electrical Code shall be followed with respect to delivering Power over Ethernet (all versions) over 4-Pair telecommunications cable.
    - c. The Electrical Engineer shall coordinate with the Low Voltage Systems Designer for the quantity of data cables required for all



telecommunication rooms in project scope and verify all power requirements and components.

- d. The TR UPS distribution panel fed from the MER UPS system will be sized on a based on the requirements of the TR with a minimum size to accommodate a minimum of four dedicated 30 amp 2 pole circuits with 100% expansion space.

#### 5.6.7 Additional TR Design Considerations:

5.6.7.1 NEC Section 110.26 requires three (3) feet of clear working space around equipment with exposed live parts. This applies to communication Telecommunication Rooms.

5.6.7.2 It is essential that clear, unobstructed access to cable tray and conduits be provided within the TR. When possible, entrance conduit and distribution conduit/cable tray should enter and exit on the same wall. If this is not possible, cable tray inside the room should be provided for distribution from wall to wall.

### 5.7 Equipment Racks, Cabinets, and Cable Management

#### 5.7.1 Overview

5.7.1.1 The Cable Management System shall be used to provide a neat and efficient means for routing and protecting fiber and copper cables and patch cords on telecommunication racks and enclosures.

5.7.1.2 The system shall be a complete cable management system comprised of floor mount racks, vertical and horizontal cable managers to manage cables on both the front and rear of the rack.

5.7.1.3 The system shall protect network investment by maintaining system performance, controlling cable bend radius and providing cable strain relief.

#### 5.7.2 2-Post Equipment Racks

5.7.2.1 Passive equipment racks shall house Cable Termination components (e.g. Patch Panels, Fiber Optic Enclosures, etc.) and active equipment racks shall house Electronic Equipment (e.g. Network Switches, Routers, Servers, etc.). Electronic Equipment will typically be furnished and installed by CSCU, however the designer must coordinate equipment requirements with CSCU so adequate rack space can be allocated.

5.7.2.2 Racks shall typically be 84" in height and shall be self-supporting. In certain situations with limited space in the MER and/or TR, 96"H equipment may be specified, but must be approved by CSCU.

5.7.2.3 All Racks shall be standard 19" wide.

5.7.2.4 Channel uprights shall be spaced to accommodate industry standard 19" mounting. Mounting holes shall utilize #12-24 mounting screws, and be in a 5/8"-5/8"-1/2" pattern per the EIA-310D Standard.

5.7.2.5 A passive equipment rack shall not have more than six 48-port patch panels (288 copper cable terminations) for terminating cables. If more than 200 cables are designed for a TR, a second passive equipment rack shall be installed. (If more then 400, then a third must be installed, and so on).

- a. If angled patch panels or higher density patch panels are specified (i.e. 48 ports on a 1U panel), the six patch panel per rack limit may not be applicable.
- 5.7.2.6 For each passive equipment rack installed, a minimum of one active equipment rack shall be installed. Additional active equipment racks may be required; consult with CSCU Telecommunications and College/University IT. Coordinate with CSCU to determine placement of Active equipment racks in relation to Passive equipment racks.
- 5.7.3 4-Post Equipment Racks
  - 5.7.3.1 4 post active equipment racks may be required to accommodate active equipment. The design engineer must consult with CSCU Telecommunication and College/University IT.
  - 5.7.3.2 Racks shall typically be 84” in height and shall be self-supporting. In certain situations with limited space in the MER and/or TR, 96”H equipment may be specified, but must be approved by CSCU.
  - 5.7.3.3 All Racks shall be standard 19” wide.
  - 5.7.3.4 Mounting rails shall be square-punched per the EIA-310D Standard, and must accommodate 10-32, 12-24, 1/4-20 or M6 Cage Nuts. Threaded rails on 4-post racks are not permitted unless approved by CSCU.
- 5.7.4 Enclosed Cabinets
  - 5.7.4.1 In MER/TR Rooms, 2-post and 4-post equipment racks are preferred.
  - 5.7.4.2 If lockable equipment cabinets are required, they shall meet the following guidelines:
    - a. Be a minimum of 30” in depth
    - b. Have adequate internal ventilation (i.e. fan kits).
  - 5.7.4.3 Wall mount cabinets are not to be specified without approval from CSCU, and shall only be used in situations where constructing a Telecommunications Room meeting the guidelines in this document is infeasible.
- 5.7.5 Ceiling Enclosures
  - 5.7.5.1 Ceiling enclosures for termination of cabling and housing of network switches are only to be used with approval from CSCU.
  - 5.7.5.2 Enclosure shall be designed to fit into a 2’x2’ or 2’x4’ ceiling tile, and must be properly supported from the building structure per manufacturer instructions.
  - 5.7.5.3 Enclosures must be plenum rated, and be equipped with integrated power strip and fan kit.
  - 5.7.5.4 Enclosures must be easily accessible with a ladder. No enclosures may be mounted in a ceiling more than 10’ in height.
- 5.7.6 Cable Management
  - 5.7.6.1 Vertical Cable Management
    - a. At the Telecommunication Rooms, vertical cable management shall be furnished and installed on both sides of racks to organize cables on front and rear of telecommunication racks.

- b. Vertical cable management shall be 6” wide as a minimum. When using angled patch panels, 10” wide vertical cable management should be considered.
- c. Vertical cable managers shall include components that aid in routing, managing and organizing cable to and from equipment. Panels shall protect network equipment by controlling cable bend radius and providing cable strain relief.
- d. Open cabling section on the rear shall provide easy access and routes cable bundles feeding into the back of patch panels and 1 RMU cable guides on the front shall enable fanning and managing patch cords.
- e. Door/Cover (front only) shall be able to open from the right or left and still be easily removed to allow for quick moves, adds, and changes.

#### 5.7.6.2 Horizontal Cable Management

- a. Horizontal cable managers shall include components that aid in routing, managing, and organizing cable to and from equipment.
- b. Panels shall protect network equipment by controlling cable bend radius and providing cable strain relief.
- c. The duct fingers shall include retaining tabs to retain the cables in place during cover removal.
- d. The covers shall be able to hinge from either side yet still be easily removed to allow for quick moves, adds, and changes.
- e. Where Cable Termination Hardware is wall mounted, the cable pathway shall be established for jumpers routed from the Equipment Rack(s) to the wall. This shall be in the form of slotted ducts, troughs or other means.
- f. Horizontal cable managers are not required between angled patch panels.

#### 5.7.7 Installation Guidelines

- 5.7.7.1 Equipment racks shall be bolted to the floor as recommended by the manufacturer. Multiple racks shall be joined and the ground made common on each. Racks shall also be stabilized by extending the support bracket to the overhead cable tray.
- 5.7.7.2 The rear of the rack should be approximately 40” from the wall to allow for access by maintenance personnel. In all cases, a minimum of 36” workspace in front of the rack is also required. Locations where these guidelines cannot be followed should be brought to the attention of CSCU Telecommunications Department for resolution prior to installation.
- 5.7.7.3 Positioning of hardware should be reviewed and approved by CSCU and Site Coordinator(s) prior to installation.
- 5.7.7.4 Equipment Rack shall be equipped with cable management hardware as to allow an orderly and secure routing of twisted pair cabling to the data patch panels. At minimum, one such Horizontal Jumper Management Panel shall be placed below each Fiber Optic and Category 6 Patch Panel. Additional Jumper Management panels may be required pending installation of other cable types on the rack.

- 5.7.7.5 The rack shall be equipped with rack ground bar (RGB), grounded to the Telecommunications Ground (TGB) using a #6 AWG (or larger) insulated stranded copper conductor (GREEN jacket).
- 5.7.7.6 Each rack shall be equipped with a vertical rack-mount power strip, including a 10-foot cord with plug matched plug into receptacle located above rack per the electrical requirements in section 5.5.2.11 of this document. Vertical power strips shall contain a minimum of twenty (20) L5-20R receptacles and a power meter. Confirm with CSCU if any IEC-C13 or IEC-C19 receptacles are required on the power strip. Standoff mounting brackets are required so power strip does not block rear rail or vertical wire manager.

## 6. Backbone Cabling

### 6.1. Inter-Building Copper Backbone Cabling (Outside Plant)

6.1.1. The Copper Backbone cable shall meet or exceed the ANSI/TIA Category 3 performance requirements.

6.1.2. A minimum of 50 pairs of copper cable are to be installed from the Campus Node Room to the BDP. CSCU will identify the Campus Node Room. Additional pairs may be required based on the needs of the College/University and will be identified during the design phase of the project.

6.1.3. OSP Copper Backbone Cable shall incorporate 24 AWG solid copper conductors insulated with a polyvinyl chloride skin over expanded polyethylene with a gel-based (ETPR) filling compound. Conductors shall be twisted to form pairs and fully color-coded.

6.1.4. OSP rated cables may not be routed within a building more than 50' unless placed in metallic conduit.

### 6.2. Inter-Building Fiber Optic Cabling

6.2.1. OSP Fiber optic backbone cable shall be stranded loose tube cable consisting of a minimum 96 strands of singlemode cable. All fiber strands will be terminated with LC connectors. No fiber will be daisy chained for use on the CSCU network.

6.2.2. All OSP fiber shall be installed in PE constructed corrugated inner duct when placed in underground conduits. The underground 4" conduits will house a minimum of three 1-1/4" innerducts per conduit.

6.2.3. OSP rated cables may not be routed within a building more than 50' unless placed in metallic conduit.

### 6.3. Intra-Building Copper Backbone Cabling (Inside Plant)

#### 6.3.1. Overview

6.3.1.1. The function of the backbone wiring is to provide the interconnection between each telecommunications room (TR), building demarcation point (BDP), and Main Equipment Room (MER) in the telecommunications system-wiring structure.

6.3.1.2. All backbone cables shall be Plenum rated (CMP, CATVP, OFNP, etc).

#### 6.3.2. Voice Backbone Cabling

6.3.2.1. The Voice Backbone cable shall meet or exceed the ANSI/TIA Category 3 performance requirements.

6.3.2.2. Voice Backbone Cable shall incorporate 24 AWG solid copper conductors insulated with a polyvinyl chloride skin over expanded polyethylene. Conductors shall be twisted to form pairs and fully color-coded.

- 6.3.2.3. Voice backbone cables shall be terminated on wall mounted 110 type blocks with C5 clips at BDP, MER & TRs. Termination field shall include all troughs as required for cable management. All 110 blocks shall be labeled indicating the source / destination of the cable.
- 6.3.2.4. A minimum of one 24-port CAT 6 patch panel shall be installed in each MER and TR for special circuits and/or analog phones. The CSCU Telecommunications department will designate the equipment rack that will house this patch panel. CAT 6 cable will be installed from the patch panel to a wall mounted 110 type block on an adjacent wall (location to be designated by CSCU).
- 6.4. Intra-Building Fiber Backbone Cabling (Inside Plant)
- 6.4.1. Fiber optic backbone cable installed between the MER and each TR shall be 24 strands of Single Mode OS2 rated cable. The cables shall be OFNP rated.
- 6.4.2. The indoor fiber optic backbone cable shall have inter-locking armor made of aluminum. Armor sheath must be properly bonded to the TGB at each end unless a dielectric armored cable is utilized.
- 6.4.3. All fiber strands will be terminated with LC connectors.
- 6.4.4. No fiber will be daisy chained for use on the CSCU network.
- 6.4.5. The use of pre-terminated fiber trunk cables are permitted within Data Centers, MER Rooms, and other locations if approved by CSCU. When connected to the cassette in the fiber enclosure, the fiber trunk shall be broken out to LC connectors on the front side of the enclosure.
- 6.5. Coaxial Backbone Cabling
- 6.5.1. Acceptable Cable Types:
- 6.5.1.1. RG-11 Quad Shield
- 6.5.1.2. P3-500
- 6.6. Termination of Backbone Cabling
- 6.6.1. Copper Cabling
- 6.6.1.1. Each 25-Pair binder group is to be terminated to a wall-mounted 110-Style termination block using C5 clips.
- 6.6.1.2. Outside plant copper cables shall be terminated to a Building Entrance Terminal (BET) with sufficient capacity to allow for termination and protection of all incoming pairs. BEP to be bonded to TMGB/TGB with minimum #6 AWG ground wire. Each cable pair to be protected with Solid State 5-Pin Protector Module designed to protect both analog and digital circuits.
- 6.6.2. Fiber Optic Cabling
- 6.6.2.1. Fiber Optic Enclosures
- a. Separate patch panels shall be installed for each type (single mode and multimode) of fiber optic cable and shall be labeled accordingly.

- b. All terminated fibers shall be mated to duplex LC couplings mounted on enclosed patch panels. Couplers shall be mounted on a panel that, in turn, snaps into the enclosure.
- c. The patch panel enclosure shall be sized to accommodate the total fiber count to be installed at each location plus 20% for expansion.
- d. Patch panels shall be designed for easy installation, front removal and expansion of snap-in adapter panels.
- e. Patch panels shall be enclosed assemblies affording protection to the cable subassemblies and to the terminated ends. The enclosures shall incorporate a hinged or retractable front cover designed to protect the connector couplings and fiber optic jumpers.
- f. The patch panel's enclosure shall provide for strain relief of incoming cables and shall incorporate radius control mechanisms to limit bending of the fiber to the manufacturer's recommended minimums or 1.2", whichever is larger.
- g. Access to the inside of the patch panel enclosure during installation shall be from the front and rear. Panels that require any disassembly of the cabinet to gain entry shall not be accepted.
- h. All patch panels shall provide protection to both the "facilities" and "user" side of the coupling. The patch panel enclosure shall be configured to require front access only when patching. The incoming cables (e.g., backbone, riser) shall not be accessible from the patching area of the panel. The enclosure shall provide a physical barrier to access of such cables.
- i. Fibers shall be terminated either by (1) splicing of factory-terminated cable assemblies ("pigtailed") or (2) the use of a "fan-out" kit. In the latter approach, individual fibers are to be secured in a protective covering – such as an Aramid reinforced tube for example - with connectors mated to the resulting assembly. In both instances, the termination hardware shall incorporate a mechanism by which cable and sub-assemblies are secured to prevent damage. Splicing shall be by the "fusion" method. Individual splice loss shall not exceed 0.2 dB.

#### 6.6.2.2. Fiber Optic Coupler (Adapter Modules)

- a. All terminated fibers at the Telecommunication Rooms shall be mated to couplings mounted inside fiber enclosures. Couplings shall be mounted on a panel that, snaps into the housing assembly. Any unused panel positions shall be fitted with a blank panel inhibiting access to the fiber optic cable from the front of the housing.
- b. Couplings shall be color coded. Singlemode couplings shall be Blue and Laser Optimized OM3/OM4 Multimode shall be Aqua. For applications requiring angled polished connectors (APC), the coupling color shall be Green.
- c. All couplings shall be fitted with a dust cap.
- d. Fibers from multiple locations may share a common enclosure but must be segregated on the connector panels and clearly identified.

Fibers from multiple destinations may be secured in a common enclosure, provided that they are clearly identified as such. Fibers from different locations shall not share a common connector panel (e.g. “insert”).

- e. Slack in each fiber shall be provided as to allow for future re-termination in the event of connector or fiber end-face damage. Adequate slack shall be retained to allow termination at a 30” high workbench positioned adjacent to the termination enclosure(s). A minimum of 1-meter (~39”) of slack shall be retained regardless of panel position relative to the potential work area.
- f. Insertion loss of two mated connectors shall be less than or equal to 0.75dB.

#### 6.6.2.3. Fiber Connectors

- a. Fiber optic connector shall be small factor connector “LC” style.
- b. The connector shall meet or exceed a Fiber Optic Connector Intermateability Standard (FOCIS) document (TIA/EIA-604-10).
- c. The LC connector must meet the mechanical and environmental performance requirements set forth in ANSI/TIA-568-C.3. The basic minimum requirements for an optical connector are maximum loss of 0.75 dB for multimode or singlemode fibers and a minimum return loss of 20 dB for multimode and 26 dB for singlemode fiber.
- d. Applications requiring broadcast video may require the use of Angled Polished Connectors (APC). Coordinate with CSCU IT Staff for specific requirements.
- e. Connectors shall sustain a minimum of 200 mating cycles per TIA-455-21 without violating specifications.



## 7. Horizontal Cabling

### 7.1 PROHIBITED

- 7.1.1 Daisy chaining of conduit.
- 7.1.2 Splitting copper pairs between jacks. Each 4-pair cable shall be terminated in an eight-position modular jack at the work area outlet.
- 7.1.3 Sharing the outlet and conduit pathway.
- 7.1.4 Using traditional nylon synch style tie wraps to bundle cables. Only Velcro style tie wraps are acceptable.
- 7.1.5 Copper Clad Aluminum (CCA) cables. All Cat-6/6A conductors shall be pure copper.
- 7.1.6 Painting of cables. All installed cables shall be protected so that paint does not adhere to the cable jacket, and potentially void the cable warranty.

### 7.2 General Requirements

- 7.2.1 Telecommunications outlets shall be wired with unshielded, twisted pair 23 AWG wire (UTP) with suitable insulation and sheath material to meet or exceed ANSI/TIA-568-C.0 and ANSI/TIA-568-C.1 or equivalent. The wire shall be type communications riser cable (CMR) or communications plenum cable (CMP) (UL) with rating dependent or NEC Section 800-15.
- 7.2.2 Structure cabling distribution system shall be designed and installed in a “star” or “hierarchical star” topology configuration with the MER being the central “hub.”
- 7.2.3 The sum total cable length between each Work Area Outlet (WA) to Telecommunication Room (TR) shall not exceed 295 ft.
- 7.2.4 NO SPLICES or TAPS are allowed. Each run from outlet to panel must be a single continuous cable.
- 7.2.5 Each Work Area Outlet shall be supplied by no less than two (2) separate communication cables.
- 7.2.6 Cables shall, at a minimum, adhere to the Category 6 specifications (higher categories when approved).
- 7.2.7 UTP cables shall be terminated on an eight conductor eight position (commonly referred to as “RJ45”) jack. The wiring scheme shall T568B unless existing terminations in an existing building utilize the T568A scheme in which case T568A may be used.

- 7.2.8 Termination Hardware (Blocks and Patch Panels) Positioning and Layout must be reviewed and approved by CSCU Telecommunications Department prior to construction. The review does not exempt Contractor from meeting any of the requirements stated in this document.
- 7.2.9 Any cables installed in ‘wet locations’ as defined by the NEC (including below grade conduits), must utilize an OSP rated Cat-6/6A cable. CMX rated cables may also be used where applicable. Examples include routing cables to a floor box in a slab on grade application, or to outdoor CCTV Cameras.
- 7.2.10 A Cat-6/6A building entrance terminal must be used in the channel to protect equipment. Each incoming OSP rated cable must be protected. Entrance terminals must be properly bonded to the TR grounding system or to building steel.
- 7.3 Horizontal Fiber Cabling
- 7.3.1 Powered Fiber
- 7.3.1.1 Devices located greater than 295’ from a Telecom Room may utilize a power fiber cable to extend network connectivity and Power over Ethernet (PoE) beyond the traditional 295’ limit.
- 7.3.1.2 Typically applications include but are not limited to:
- Outdoor CCTV Cameras not attached to the façade of a building (i.e. on a light pole).
  - Outdoor Wireless Access Points
  - Digital Signage
  - Outdoor Digital Signage
- 7.3.1.3 Pathways to outdoor devices must be coordinated with the Site/Civil engineer, including providing sufficient pull points and sufficient conduit diameter. Refer to Section 4 of this document for Exterior Pathway guidelines.
- 7.3.1.4 Products include Berk-Tek OneReach, CommScope Powered Fiber, or equivalent.
- 7.3.2 Fiber to the Desk (FTTD)
- 7.3.2.1 Horizontal fiber to locations within distance to a Telecom Room are not approved for use unless otherwise authorized by CSCU.
- 7.3.3 Passive Optical Networking (PON / GPON)
- 7.3.3.1 A PON / GPON solution may be considered as an alternative to a standard Structured Cabling System, however it must be reviewed and approved by CSCU prior to design and implementation.
- 7.4 Horizontal Coax Cabling
- 7.4.1 If required, coax cabling to be RG-6 Quad Shield and plenum rated (CATVP).

## 7.5 Horizontal Copper Cabling

- 7.5.1 All horizontal data cables shall be Category 6 UTP to support 1 Gbps data rates, except as noted. Cables shall terminate on modular Patch Panels in the Telecommunications Rooms.
- 7.5.2 Refer to Appendix A for a listing of cable quantities and types for typical devices and work areas.
- 7.5.3 The following devices require cabling other than Category 6 UTP:
- Wireless Access Points are to receive two Category-6A STP cables.
  - IP enabled door locks require one Category-6 STP cable with drain wire.
  - Twisted pair cabling used for Audio Visual HDBase-T applications shall utilize a shielded Category-6A cable.
- 7.5.4 IEEE 802.3an standard defines the requirements for transmission of 10 Gbps. For applications requiring 10 Gbps data rates, an augmented Category-6 cable (Category-6A) must be specified. Given the larger cable diameters and weight of Category-6A, cable pathways, cable supports, rack requirements, conduit and backbox requirements, etc. must be adjusted to accommodate a Category-6A system.
- 7.5.5 The maximum permitted horizontal distance is 295 feet with 33 additional feet allowed as the total cumulative length for patch cables, jumpers cords, etc. (total maximum length not to exceed 328 feet).
- 7.5.6 Category 6 and 6A cables shall be suitable for installation free-air, in building risers, in conduit and/or in cable tray and carry CMP or CMR rating dependent or NEC Section 800-15.
- 7.5.7 The following characteristics of the Category-6 and 6A cables must be adhered to:
- 7.5.7.1 Category-6 cable shall be ‘enhanced’, often referred to as Category-6e. Minimum compliant cable is not acceptable. Headroom above TIA Standards for NEXT and PSNEXT shall be at least 3dB. All Cat-6 cables shall be constructed with an internal pair separator.
  - 7.5.7.2 Category-6A shielded cable shall have an overall shield over all pairs, and constructed to support Power over Ethernet of up to 100 Watts.
  - 7.5.7.3 All cable must be constructed of pure copper. Aluminum clad copper cable is not acceptable.
- 7.5.8 The jacket color for data cables shall be coordinated with the Owner. The jacket color for the CCSU campus is as follows.
- 7.5.9 **POE Persona Locks – Purple**
- 7.5.10 **CCTV – Pink**  
**Wireless – Yellow**  
**Data 1 – Blue**

**Data 2 – Green**

**Pots – Grey**

**Fire Alarm – Red**

**Temp control - White**

#### 7.5.11 Category-6 and 6A Jacks

- 7.5.11.1 Horizontal cables shall each be terminated at their designated workstation location on modular Category 6/6A jacks. The jacks shall snap into a modular faceplate.
- 7.5.11.2 Each jack shall be labeled with TR #, panel # and jack ID numbers.
- 7.5.11.3 Jack colors shall be coordinated with the Owner.
- 7.5.11.4 Additional modules for copper shall include the following:
  - a. F-Type coax coupler module, female-female threaded
  - b. HDMI Module
  - c. Female-female coupler module
  - d. HDMI with 110-style termination.
  - e. USB Module
  - f. Coupler module (USB-A or USB-B Style)
  - g. USB with 110-style termination.
  - h. 3.5mm Audio Jack
- 7.5.11.5 **IMPORTANT:** Cable and Termination Components (Jack, Patch Panel, and Wiring Blocks) shall be designed and installed to function as a System. The compatibility of the cable to be installed with the proposed termination components shall be recognized and documented by the Termination Component Manufacturer.

#### 7.5.12 Category-6 and 6A Patch Panels

- 7.5.12.1 Data horizontal cables shall be terminated at the Telecommunication Rooms on high-density angled modular patch panels.
- 7.5.12.2 Data Patch Panels shall be designed and installed in a fashion as to allow future station cabling to be terminated on the panel without disruption to existing connections.
- 7.5.12.3 Data Patch panels shall be sized to accommodate a minimum of 20% growth in the quantity of stations relative to the initial installation.
- 7.5.12.4 The patch panels shall contain labels on a front for easy port edification.
- 7.5.12.5 STP cables must be terminated to patch panels designed for this purpose. These patch panels must be properly bonded to the grounding system in the Telecom Room. Vertical Rack Grounding Bars (RGB) located on the equipment racks facilitate this bonding.

#### 7.5.13 Faceplates

- 7.5.13.1 Faceplates shall be plastic and incorporate recessed designation strips at the top and bottom of the frame for identifying labels. Designation strips shall be fitted with clear plastic covers.
  - 7.5.13.2 Any unused jack positions shall be fitted with a removable blank inserted into the opening.
  - 7.5.13.3 Single gang faceplate shall be installed, where a standard single gang mod ring mount over dual gang outlet box.
  - 7.5.13.4 Dual gang faceplates shall be installed where a dual gang outlet box used for the telecommunications outlet.
  - 7.5.13.5 Wall-mounted “Wall Phone” outlets shall be installed where identified on the Floor plan Drawings to accommodate wall-mounted telephone sets. The Wall Plate shall be a single gang faceplate to accommodate one data jack, mounted on a standard single gang outlet box or bracket.
- 7.5.14 Installation Practices
- 7.5.14.1 Station Cabling
    - a. All new telecommunication outlets shall contain a minimum of two Category 6 rated cables.
    - b. This configuration will support current applications and present an additional growth capability.
    - c. All Cat-6 cables shall be terminated in compliance with Category 6 specifications to two RJ45 jacks and labeled with the MER/TR #, Patch Panel #, and jack ID numbers.
    - d. Locations and quantities of telecommunication outlets shall comply with the CSCU specification.
    - e. Station cables shall be run in conduit, free-air, above drop ceiling, or in cable tray from the Telecommunications Room to the WA serving each area.
    - f. Contractor shall be responsible for installing station cabling in such a manner as to avoid unnecessarily long runs. Any area that cannot be reached within the above constraints shall be identified and reported to the architect prior to installation, so that the architect may discuss changes to the plan with CSCU.
    - g. Contractor shall avoid abrasion and other damage to cables during installation.
    - h. All cable shall be free of tension at both ends.
    - i. Where installed free-air, installation shall consider the following:
      - i. Cable shall run at right angles and be kept clear of other trades’ work.
      - ii. Cables shall be supported according to code utilizing “J-“ hooks or cable wraps anchored to ceiling concrete, walls, piping supports or structural steel beams.
      - iii. Those devices shall be designed to maintain cables bend to larger than the minimum bend radius (typically 4 x cable diameter).
      - iv. Supports should be spaced at a maximum of 4-foot intervals unless limited by building construction. If cable

- “sag” at mid-span exceeds six (6) inches, another support shall be used.
- v. Cable shall never be laid directly on the ceiling grid.
  - vi. Cables shall not be attached to existing cabling, plumbing or steam piping, ductwork, ceiling supports or electrical or communications conduit.
  - j. Manufacturers minimum bend radius specifications shall be observed in all instances.
  - k. Use of loop-and-hook (Velcro) type fasteners is the preferred method to bundle cables together. If plastic tie wraps are needed to attach cable bundles to anchors, then the tie wraps should be left loose fitting. No sharp burrs should remain where excess length of the cable tie has been cut. Also, tie wraps must not be used on cable bundles exceeding 24 cables, or Cable Tray is the appropriate method of supporting cables.
  - l. Cable sheaths shall be protected against damage from sharp edges. A bushing or grommet shall be used to protect the cable wherever it passes over a sharp edge.
  - m. A one (1) foot coil of each cable shall be placed in the ceiling at the last support (e.g. J-Hook, Bridal Ring, etc.) before the cables enter a fishable wall, conduit, surface raceway or box. At any location where cables are installed into movable partition walls, via a service Pole, approximately 15-feet of slack shall be left in each station cable under 250-feet in length to allow for change in the office layout without re-cabling. These “service loops” shall be secured at the last cable support before the cable leaves the ceiling, and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.
  - n. Refer to Section 3.2.12 of this document for separation requirements from EMI sources.
  - o. At Work Area Outlets and Patch Panels, the installer shall insure that the twists in each cable pair are preserved to within 0.5-inch of the termination for the cables. The cable jacket shall be removed only to the extent required to make the termination.
  - p. Twisted pair cabling for connection to a Wireless Access Point (WAP) or CCTV Camera may be terminated with a Male RJ-45 connector for direct connection to the device. Shielded jacks must be used at WAP locations.

#### 7.5.14.2 Aesthetics

- a. All cables terminating at the patch panels shall be vertically straight, with no cables crossing each other, from twelve inches inside the ceiling area to the termination block.
- b. All MER/TR tie and station cable bundles shall be combed and bundled to accommodate individual termination block rows and patch panels. Each tie cable or cable bundle shall be secured to both the distribution frame and the structure to which the frame is

attached with anchor points, placed a maximum of nine inches apart, starting at the center of the top of the termination block. Anchor points will extend up each cable or cable bundle to a point a maximum of two inches below the false ceiling or from under the raised floor.

- c. Cable bundles for station cables should not exceed 24 cables per bundle.
- d. For any given MER/TR, a horizontal and vertical alignment for all mounting hardware will be maintained to provide a symmetrical and uniform appearance to the distribution frame.
- e. All surface-mounted devices shall be firmly secured, including station cable termination plates/jacks.

#### 7.5.14.3 Work Area Outlet

- a. Work Area Outlets shall be flush-mounted on wall-mounted boxes, in floor-mounted boxes, and on modular furniture.
- b. Any outlets to be added where these conditions are not met shall be positioned at a height matching that of existing services or as directed otherwise by the Site Coordinator and the Architect. Nominal height (from finished floor to center line of Outlet) in new installation shall be as follows:
  - i. Standard Work Area Outlet (WA): 18” above finished floor.
  - ii. Wall-Mounted Telephone Outlet (WA-W): 48” above finished floor.
  - iii. Wall-Mounted Wireless Access Point Outlet (WAP): 96” above finished floor, or 12” below finished ceiling.
  - iv. Ceiling-Mounted Wireless Access Point: Box to be located a minimum of 12” above the accessible ceiling to allow ceiling tiles to be removed. If the installation required a Wireless Enclosure (i.e. Oberon enclosure), cables are to be terminated inside the enclosure.
  - v. CCTV Cameras: Height to be coordinated with Security designer or integrator.
  - vi. LED Screens (TV / Digital Signage): Height to be coordinated with Audio Visual designer or integrator. If an in-wall A/V box is specified (i.e. PAC box), the cables will be terminated inside the in-wall box.

## 8. Grounding and Bonding

### 8.1 Overview

#### 8.1.1 ANSI/TIA-607-C Commercial Building Bonding and Grounding

Requirements for Telecommunications define bonding as the physical joining of conductive materials bringing them to the same electrical potential. Grounding is the physical connection of conductive materials to ground or an electrical potential of zero. If both the transmitting and receiving stations are not referencing the same zero potential, data errors will occur. In order for network communications systems to perform properly, all components of the system must be bonded and grounded per ANSI/TIA specifications. In addition, grounding is essential for the protection of life and property. Properly bonded and grounded systems will conduct electrical energy (static, lightning, short circuit, etc.) away from sensitive equipment as well as living creatures and either trip protective devices or dissipate this energy safely to ground. The goal of a proper grounding and bonding system is to have no more than 5 ohms impedance between any two-grounded points in the building. A good rule of thumb is, if it's metal, ground it.

8.1.2 The grounding system must be intentional, visually verifiable, and adequately sized to handle expected currents safely. The grounding system shall be designed and installed in accordance with the NECA/BICSI 607-2011 and ANSI/TIA-607-C Standard for Bonding and Grounding Planning for commercial buildings.

8.1.3 Ground conductors shall be of electrical grade copper except where otherwise indicated. Grounding connector shall be uninsulated unless otherwise indicated.

8.1.4 All permanent grounding connections shall be exothermic welded connections. Cadweld or thermOweld processes are acceptable.

### 8.2 TMGB – Telecommunications Main Grounding Busbar

8.2.1 All telecommunications grounding and bonding systems begin at the Telecommunications Main Grounding Busbar (TMGB), which is usually located in the MER.

8.2.2 The length of this bar is determined by the amount of connections that will be made to it, but the minimum thickness is ¼ inch. The TMGB shall be 4 inches high, a minimum of 20 inches long, and of variable length to accommodate the expected number of lugs and allow for future growth.

8.2.3 TMGBs shall be electrotin plated for reduced contact resistance.

8.2.4 The TMGB shall be mounted using minimum 2-inch insulated standoffs.

8.2.5 The TMGB is connected to the building's main electrical panel ground by a licensed/certified electrical contractor.



- 8.2.6 When connecting the TMGB to a buried ground rod or field, only exothermic connections shall be used.
- 8.2.7 TMGBs shall be assigned a unique identification and permanently labeled.
- 8.3 TGB – Telecommunications Grounding Busbar
  - 8.3.1 Telecommunications Grounding Busbars, or TGB’s, are located in Telecommunications Rooms (TR) to provide grounding for racks, enclosures, and equipment in these spaces.
  - 8.3.2 The length of this bar is determined by the amount of connections that will be made to it, but the minimum thickness is ¼ inch and the minimum width is two inches.
  - 8.3.3 TGBs shall be electrotin plated for reduced contact resistance.
  - 8.3.4 The TGB shall be mounted using minimum 2-inch insulated standoffs.
  - 8.3.5 When there is an electrical panel present in these rooms, it shall be bonded to the TGB by a licensed/certified electrical contractor using a #6 AWG bonding conductor. When an electrical panelboard is not located in the room, a #6 AWG bonding conductor should be run from the busbar to the nearest electrical panelboard (where feasible).
  - 8.3.6 All metal racks, enclosures, equipment and cable pathways entering these spaces shall be bonded to the TGB using minimum #6 AWG wire and crimp or weld-on lugs.
  - 8.3.7 All exposed/accessible building steel within these spaces shall be bonded to the TGB using minimum #6 AWG wire and crimp or weld-on lugs.
  - 8.3.8 TGBs shall be assigned a unique identification and permanently labeled.
- 8.4 TBB – Telecommunications Bonding Backbone
  - 8.4.1 The Telecommunications Bonding Backbone or TBB is used to connect all TGBs throughout a building to the TMGB.
  - 8.4.2 The busbars on each floor shall be bonded to the Telecommunications Bonding Backbone (TBB). The TBB shall be routed in as straight a line as possible and be continuous, with no splices, from the TMGB to the top floor TGB. It shall be sized in accordance with ANSI/TIA-607-C (See Table 1). The bend radius on any necessary bends in this cable should be greater than 8 inches.

Table 1: Sizing of the TBB

TBB Length in Linear meters (feet)	TBB Size (AWG)
Less than 4 (13)	6
4-6 (14-20)	4
6-8 (21-26)	3

TBB Length in Linear meters (feet)	TBB Size (AWG)
8-10 (27-33)	2
10-13 (34-41)	1
13-16 (42-52)	1/0
16-20 (53-66)	2/0
Greater than 20 (66)	3/0

- 8.4.3 The TMGB shall be bonded to an approved grounding electrode and to the building's main electrical ground system. This grounding electrode conductor shall be no smaller than the TBB. Connections to the TGBs at every floor except the top floor shall be made via copper compression H-Tap (see section 8.4.9) and a conductor no smaller than the TBB.
- 8.4.4 The TBB shall be an insulated copper conductor sized to allow no more than 25 ohms resistance between any two points in the grounding system. The minimum conductor size is #6 AWG.
- 8.4.5 When two or more TBBs are run vertically in a multi-story building, they shall be bonded together using a TBB Intermediate Bonding Conductor or TBBIBC. TBBIBCs shall be installed at the top floor and a minimum of every third floor with a Grounding Equalizer (GE), which is equal in size to the TBB.
- 8.4.6 TBB/TBBIBCs shall be installed and protected from physical and mechanical damage.
- 8.4.7 Any metallic conduit used to protect grounding or bonding conductors shall be bonded to that conductor.
- 8.4.8 TBBs shall be assigned a unique identification and permanently labeled.
- 8.4.9 Compression Fittings
- 8.4.9.1 Lugs and HTAPs must be manufactured of tin plated copper and fastened via irreversible compression (crimped). Lugs shall have spacing to fit Panduit GB series predrilled busbars and a window to allow for inspection of the crimp. HTAPs shall be contained in clear covers that allow inspection of the die marks to ensure that the proper die was used.
- 8.4.9.2 Approved HTAP's
- a. Panduit HTWC series.
  - b. Burndy YH series (when used with clear covers) or a CSCU-approved substitute.
- 8.4.9.3 Approved Lugs
- a. Panduit LCC or LCCX series.
  - b. Burndy YAZ series.
  - c. Chatsworth Products, Inc.
  - d. Electric Motion Company CCL Series.

## 8.5 Rack Grounding

8.5.1 Electrical continuity throughout each rack or cabinet is required to minimize safety risks. The racks shall be assembled using paint-piercing grounding washers (Panduit Part no. RGW, or CSCU-approved substitute) and antioxidant (per the recommendations of the manufacturer). An electrostatic discharge port kit (Panduit RGEDS, or CSCU-approved substitute) shall be placed on the rack (on the right side when facing the rack) at 40 inches above the floor. All bonding connections to the rack shall be made with thread-forming screws (Panduit Part no. RGTS, or CSCU-approved substitute), or the threads must be cleaned of all paint or residue (per the NEC).

8.5.2 In locations with multiple racks, the rack shall be connected to the common bonding network with a #6 AWG conductor and a copper compression HTAP. In locations with single racks, a #6 AWG conductor to the busbar is sufficient. The common bonding network is a 2 AWG continuous conductor placed below or above the racks. Refer to NECA/BICSI 607-2011 for design recommendations.

## 8.6 Pathway Grounding

8.6.1 Any metallic component, including equipment, ladder racks, enclosures, cable trays, etc. must be bonded to the grounding system. Provisions must be made to bond individual segments of ladder rack and basket tray together in order to make them electrically continuous. Any metallic conduit that carries a grounding conductor and is greater than 3 feet long must have both ends bonded to the conductor with a bonding jumper no longer than 12 inches and fastened with a compression HTAP to the conductor on one side and to the conduit on the other.

## 8.7 Equipment Grounding

8.7.1 Although AC-powered equipment typically has a power cord that contains a ground wire, the integrity of this path cannot be easily verified. Thus, many equipment manufacturers require grounding above and beyond that which is specified by local electrical codes, such as the NEC. Always follow the grounding recommendations of the manufacturer when installing equipment.

## 8.8 Grounding of Outdoor Wireless Access Points and other Antenna equipment

8.8.1 If outdoor Wireless Access Point is equipped with a ground wire, this ground wire shall be extended into the building and bonded to building steel. If no steel structure is available to bond to, route ground wire to nearest electrical panel.

## 8.9 Testing and Documentation of Grounding

8.9.1 The grounding system shall be documented by means of a diagram showing the locations of the busbars and the size of the conductors, indicating all connections between conductors from the busbars or TBB back to the building electrical grounding system. This includes: connections to building AC panelboards, building steel, the building electrical service ground, connections between the busbar(s) and the TBB. If not connected with a two-hole lug, the connection type of any bonding connection (HTAP, clamp, etc.) between the busbar and the building ground point should be specified on the drawing.

8.9.2 To ensure that bonding connections from the busbar to infrastructure within the telecommunications spaces are of low resistance and that the impedance to ground is as low as possible, the following checks shall be performed.

8.9.2.1 Lugs: Visually check that the conductor is visible in the window of the lug to ensure that it was fully inserted, and that the lug is properly crimped. Check that the lug is fastened through both mounting holes, that the connection is tight and that antioxidant was used (if necessary).

8.9.2.2 HTAPs: Ensure that the mark left on the HTAP indicates that the appropriate manufacturer-recommended die was used for that HTAP, and that the connection is protected by a clear cover that allows visual inspection.

8.9.2.3 Racks: Visually check that the racks have been assembled with paint-piercing washers or are constructed so as to make such measures unnecessary (i.e. welded).

8.9.2.4 Conduits: If a bonding conductor is routed through a metallic conduit more than three feet long, ensure that both ends of the conduit are bonded to the conductor with a suitable method, avoiding sharp bends in the cable. Looping the conductor itself through the conduit bonding collar is prohibited.

8.9.3 Measurements – Ensure that the measurement of the following connections is less than 0.1 ohms:

8.9.3.1 Lug to HTAP for any connections to Common Bonding Network.

8.9.3.2 Rack bonding lug to any rack section (the paint-piercing washers make good test points).

8.9.3.3 Bonding lugs to busbar, cable tray, and cable bond.

## 9. Testing, Acceptance, Documentation and Labeling

### 9.1 Test Requirements for Horizontal Copper Cabling

- 9.1.1 Horizontal cabling testing shall be conducted from the jack at the outlet in the Work Area to the Termination Block on which the cables are terminated at the MER or TR.
- 9.1.2 Baseline accuracy of the test equipment must exceed TIA Level III, as indicated by independent laboratory testing. Test adapter cable must be approved by the manufacturer of the test equipment.
- 9.1.3 All horizontal copper cables must be tested with a Level 3 Fluke DTX Networks Cable Tester.
- 9.1.4 Testing of the Permanent Link shall be performed. However, Contractor shall warrant performance based on channel performance and provide patch cords that meet channel performance criteria. All cabling not tested strictly in accordance with these procedures shall be retested at no cost to the Owner.
- 9.1.5 Horizontal “Station” cables shall be free of shorts within the pairs, and be verified for continuity, pair validity and polarity, and Wire Map (Conductor Position on the Modular Jack). Any defective, split or miss-positioned pairs must be identified and corrected.
- 9.1.6 Testing of the Cabling Systems rated at TIA Category 6 and above shall be performed to confirm proper functioning and performance.
- 9.1.7 Testing of the Transmission Performance of station cables (Category 6 shall include:
  - a. Length
  - b. Attenuation
  - c. Pair to Pair NEXT
  - d. ACR
  - e. PSNEXT Loss
  - f. Return Loss
  - g. Pair to Pair ELFNEXT Loss (Equal Level Far End Cross-Talk)
  - h. PSEFEXT Loss
  - i. Propagation Delay
  - j. Delay Skew
- 9.1.8 The maximum length of station cable shall not exceed 295 feet (90 meters), which allows 33 feet (10 meters) for equipment and patch cables.
- 9.1.9 Cables shall be tested to the maximum frequency defined by the ANSI/TIA-568-C standards covering that performance category. Test records shall verify a “PASS” on each cable and display the specified parameters—comparing test values with standards based "templates" integral to the unit.

- 9.1.10 Any “Pass\*” or “Warning” test results shall be considered a “FAIL” for the channel or permanent link under test. In order to achieve an overall “Pass Condition”, the test result for each individual test parameter must be “PASS”
- 9.1.11 All data shall indicate the worst-case result, the frequency at which it occurs, the limit at that point, and the margin. These tests shall be performed in a swept frequency manner from 1MHz to the highest relevant frequency, using a swept frequency interval consistent with TIA and ISO requirements. Information shall be provided for all pairs or pair combinations, and in both directions when required by the appropriate standards.
- 9.2 Test Requirements for Fiber Optic Cabling System
- 9.2.1 Upon completion of cable installation and termination, the Fiber Optic cabling shall be tested to include Optical Attenuation (“Insertion Loss” Method).
- 9.2.2 Optical Attenuation Testing
- 9.2.2.1 Optical Attenuation shall be measured on all terminated optical fibers, in both directions of transmission, using the “Insertion Loss” method. Measurement shall be inclusive of the optical connectors and couplings installed at the system endpoints. Access jumpers shall be used at both transmit and receive ends to ensure an accurate measurement of connector losses.
- 9.2.2.2 Field test instruments for multimode fiber cabling shall meet the requirements of ANSI/TIA526-14A. The light source shall meet the launch requirements of ANSI/TIA-455-50-B.3, Method A. This launch condition shall be achieved either within the field test equipment or by use of an external mandrel wrap per ANSI/TIA-568-C.
- 9.2.2.3 Field test instruments for single mode fiber cabling shall meet the requirements of ANSI/TIA-526-7.
- 9.2.2.4 The tester shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy. Proof of tester calibration performed by the tester manufacturer may be requested by CSCU.
- 9.2.2.5 The fiber optic launch cables and adapters must be of high quality and the cables shall not show excessive wear resulting from repetitive coiling and storing of the tester interface adapters.
- 9.2.2.6 The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests detailed in the following table.
- 9.2.2.7 Tester manufacturer’s requirements must be followed.
- 9.2.3 Performance Test Parameters
- 9.2.3.1 The link attenuation shall be calculated by the following formulas specified ANSI/TIA-568-C.0 Standard.
- Link Attenuation = Cable\_Attn + Connector\_Attn + Splice\_Attn
  - Cable\_Attn (dB) = Attenuation\_Coefficient (dB/km) \* Length (Km)
  - Connector\_Attn (dB) = number\_of\_connector\_pairs \* connector\_loss (dB)

d.  $\text{Splice\_Attn (dB)} = \text{number of splices (S)} * \text{splice\_loss (dB)}$

9.2.3.2 The values for the Attenuation\_Coefficient are listed in the table below:

Type of Optical Fiber	Wavelength (nm)	Attenuation_Coefficient (dB/km)
Single-mode Outside Plant	1310	0.5
	1550	0.5
Single-mode Inside Plant	1310	1.0
	1550	1.0
Multimode Inside Plant	850	3.5
	1300	1.5

9.2.3.3 Maximum allowable mated connectors\_loss = 0.70 dB

9.2.3.4 Maximum allowable splice\_loss = 0.2 dB

9.2.3.5 Link attenuation does not include any active devices or passive devices other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.

9.2.3.6 Test equipment shall measure the link length and automatically calculates the link loss based on the above formulas is preferred.

9.2.3.7 The above link test limits are based on the use of the One Reference Jumper Method specified by ANSI/TIA-526-14A, Method B and ANSI/TIA-526-7, Method A.1. The user shall follow the procedures established by these standards or application notes to accurately conduct performance testing.

9.2.3.8 The backbone link (multimode) shall be tested in two directions at both operating wavelengths to account for attenuation deltas associated with wavelength.

9.2.3.9 Multimode backbone links shall be tested at 850 nm and 1300 nm in accordance with ANSI/TIA-526-14A.

9.2.3.10 Because backbone length and the potential number of splices vary depending upon site conditions, the link attenuation equation shall be used to determine limit (acceptance) values.

9.2.3.11 Single mode backbone links shall be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA-526-7. All single mode links shall be certified with test tools using laser light sources.

## 10. Labeling

### 10.1 Overview

- 10.1.1 All labeling shall conform to the ANSI/TIA-606-B Standard (or latest version) unless otherwise directed by CSCU.
- 10.1.2 All labels must be mechanically printed. Label background color to be white with Black print. If cable jacket color is white, use a label with a yellow background with black print.
- 10.1.3 Handwritten labels are not acceptable.
- 10.1.4 Final labeling of devices must match as-built drawings.

### 10.2 Labeling of Cabling and Termination Components

#### 10.2.1 Equipment Racks

- 10.2.1.1 Equipment Racks shall be labeled by the Contractor identifying the Telecommunication Room. Additionally, Equipment Racks shall have an alpha character after the room number unique to that particular Telecommunications Room. For example, TR1-A would be the first rack in TR1.
- 10.2.1.2 Character height shall be 1-inch (minimum).

### 10.3 Fiber Optic Backbone, Riser Cables and Termination Components

- 10.3.1 All fiber optic backbone and copper (inter-building, riser and tie) cables shall be identified AT BOTH ENDS with a designation that identifies where the opposite end of the same cable terminates (e.g. Equipment Room or Telecommunications Room I.D.). In addition, labeling of all fiber optic cables shall include the number of fibers in the cable.
- 10.3.2 Each fiber optic termination panel shall be clearly labeled indicating the destination of the cable(s) and the fiber number of each fiber position. The cable identifiers are to be secured to (1) the side and (2) the front cover of the panel enclosure.

### 10.4 Standard Work Outlet Faceplates

- 10.4.1 All faceplates shall be clearly labeled indicating the destination of the cable(s) (Telecommunication Room Number), the Data Patch Panel(s) letter designation, and the Data Port number(s) on the Data Patch Panel(s).
- 10.4.2 Telecommunications Outlets are to be labeled (1) on the cover of the assembly and (2) on each cable terminated at that location.
- 10.4.3 Station cables shall be labeled within 2-inches of the cable end.



## 10.5 Data Patch Panels

10.5.1 All Data Patch Panels shall be clearly labeled indicating the Telecommunication Room Number, The Data Patch Panel letter designation and the Data Port Number on the Data Patch Panel [Ports 1 through 48]. Each Telecommunication Room shall start with Data Patch Panel ‘A’ and continue through the Alphabet. The Data Patch Panels shall be installed to allow for growth of 20% within each Telecommunication Room.

10.5.2 Station cables at the patch panels shall be labeled within 2-inches of the cable end.

10.5.3 A Data Port Schedule for each Telecommunication Room shall be created in spreadsheet format (Excel) with the Telecommunication Room Number, Data Patch Panel Letter Designations, Data Port Numbers and Room Numbers identified in the spreadsheet. In addition for each Data Patch Panel Port a Fields shall be provided in the spreadsheet for the Owner to manage the cabling infrastructure by recording the Device and any special Notes pertaining to the Room utilizing the Data Cable terminated to the port.

## 10.6 Fiber Optic Cables and Termination Components

10.6.1 All Fiber Optic Cables, Termination Enclosure and Connector Panel, shall be clearly labeled.

10.6.2 In addition, labeling of all Fiber Optic Cables shall include the number of fibers in the cable.

10.6.3 Each Fiber Optic Termination Panel shall be clearly labeled indicating (1) the destination(s) of the cable(s) and (2) fiber number of each fiber position. The cable identifiers are to be secured to (1) the side and (2) the front cover of the panel enclosure.

## 10.7 Ground System Labeling

10.7.1 All Grounds should be labeled as close as practicable (i.e. for ease of access to read the label) to the point of termination. Labels shall be nonmetallic and include the following statement “**WARNING: If this connector or cable is loose or must be removed, please contact the Building Telecommunications Manager**”

## 11. Documentation

- 11.1 Upon completion of the installation, Contractor shall provide full documentation sets to CSCU for approval. All documentation shall become the property of the Owner.
- 11.2 Documentation shall include the items detailed in the sub-sections below:
- 11.2.1 Campus plans showing:
    - a. Conduit and manhole locations.
    - b. Cable identifiers, counts, and routes.
    - c. Any other outside facilities installed.
  - 11.2.2 Floor prints showing:
    - a. Office, building, or campus layout.
    - b. Location of all station jacks with identifying numbers.
    - c. Location and size of all communications raceways.
    - d. Cable identifiers, pair counts and routes for all station and backbone cables.
  - 11.2.3 If Wireless Access Points (WAP) are installed by contractor:
    - a. Floor plan showing the exact location of each WAP
    - b. Cable ID('s) connected to each WAP
    - c. MAC Address and Serial Number of each WAP
  - 11.2.4 BDP, MER and TR layouts.
  - 11.2.5 Cross-connect field, equipment rack and frame layouts.
  - 11.2.6 Cross-connects installed by the vendor as part of their installation.
  - 11.2.7 Telephone locations and types (if installed by the vendor).
  - 11.2.8 Certified test and inspection results both electronically and paper copy.
  - 11.2.9 Certification that all cable, associated hardware and their installation meet all requirements in this document.
  - 11.2.10 The following information is required for each fiber run:
    - a. Splice and termination points.
    - b. Cable routes.
    - c. Strip chart showing the pull tension imposed on the cable during installation.
    - d. Attenuation test results.
- 11.3 All documentation shall be consistent with the labeling used by the College/University on previous projects. The Vendor is responsible for entering appropriate data into College/University's cable management system. The College/University may also request that the information be provided in a format compatible with its electronic cable management system.
- 11.4 One hard copy of each updated cabling location table will be posted in the location Telecommunications Room (TR/MER), attached to or inside the rack or enclosure.
- 11.5 Contractor shall provide accurate as-built Construction Drawings. The drawings are to include cable routes and outlet locations. Outlet locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons and drawing conventions used shall be consistent throughout all documentation provided.

Appendix A  
CSCU Work Area Design Criteria

Note: The following table summarizes minimum cabling requirements for common spaces within a building, but is not intended to be an all-inclusive list. All cabling requirements must be confirmed on a project-by-project basis with the individual College/University, CSCU, and the Architect. Cable jacket colors shall be also confirmed with the individual College/University.

LOCATION	CABLING	MOUNTING HEIGHT	NOTES
Single Occupancy Office <150 SF	One duplex Cat-6 in proximity to desk, and one duplex Cat-6 on opposite wall or located per architectural program.	18" AFF	
Single Occupancy Office >150 SF	One duplex Cat-6 in proximity to desk, and two duplex Cat-6 on alternate walls per the architectural program.	18" AFF	
Open Office (Cubicles)	One duplex Cat-6 per desk/workstation.	Routed to base channel in furniture or 18" AFF on wall.	Coordinate infeed from floor or wall with Architect.
Shared Office	One duplex Cat-6 per desk/workstation.	18" AFF	
Residence Hall Room / Apartment	One duplex per room.	18" AFF	
Shared use printer locations	One duplex Cat-6.	18" AFF or above Counter.	Confirm with CSCU if analog line is required for Fax.

Copy Room	One duplex Cat-6 per network connected device.	18" AFF or above Counter.	Includes Printers, Copiers, Postage Meters, etc.
Huddle Room / Small Group Study Room	One duplex Cat-6.	18" AFF	
Small Conference Room with 4-12 Seats	One duplex Cat-6 below table. Additional Cat-6 as required for A/V equipment (LED, AV Switcher, etc.).	Floor Box / Poke-Thru	Coordinate if Cat-6 is located inside a floor box or routed to an in-table A/V box.
Medium Conference Room or Seminar Room with 12-20 Seats	Two duplex Cat-6 below table. Additional Cat-6 as required for A/V equipment (LED, AV Switcher, etc.).	Floor Box / Poke-Thru	Coordinate if Cat-6 is located inside a floor box or routed to an in-table A/V box.
Large Conference Room or Seminar Room with 20 or more Seats	One duplex Cat-6 per 10 seats. Additional Cat-6 as required for A/V equipment (LED, AV Switcher, etc.).	Floor Box / Poke-Thru	Coordinate if Cat-6 is located inside a floor box or routed to an in-table A/V box.
Teacher Desk / Lectern	Minimum of Four Cat-6 cables based on A/V equipment and other requirements.	18" AFF	Coordinate with College/University personnel for specific requirements.
Wall Phone	One Cat-6	48" AFF	Maintain 8" clearance on either side of wall phone.
Point of Sale device	One duplex Cat-6.	Wall mounted at 18" AFF or inside Floor Box / Poke-Thru	Confirm if analog line is needed for Credit Card device.

Wireless Access Point	Two Cat-6A Shielded with 15' Service Loop for relocation by CSCU as needed.	96" AFF if wall-mounted or inside ceiling-mounted WAP enclosure.	Terminate inside WAP enclosure unless otherwise directed. Rooms with occupancy of greater than 75 people may require more than one WAP.
Vending Machine	One Cat-6 per machine	18" AFF behind each machine.	
CCTV Camera	One Cat-6	Coordinated with Security equipment.	
IP Door Lock	One Cat-6 Shielded	Coordinated with Security equipment.	
IP Intercom Door Station	One Cat-6	Coordinated with Security equipment.	
IP Intercom Master Station	One Cat-6	Coordinated with Security equipment.	
LED Screen	One Cat-6	Coordinated with AV equipment.	HDBase-T applications require Cat-6A Shielded.
A/V Control Panel / Touch Panel	One Cat-6	Coordinated with AV equipment.	
IP Clock	One Cat-6	90" AFF	Coordinate height and location with Architect.
Time Clock	One Cat-6	48" AFF	Coordinate height and location with Architect.

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section. The CSCU Telecommunications Infrastructure Standards shall be considered as a supplement to these specifications and, where conflicts in specific requirements occur, shall take precedence.

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Communications equipment coordination and installation.
  - 2. Sleeves for pathways and cables.
  - 3. Sleeve seals.
  - 4. Grout.
  - 5. Common communications installation requirements.

### 1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

### 1.4 SUBMITTALS

- A. Product Data: For sleeve seals.

### 1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of communications equipment:
  - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  - 3. To allow right of way for piping and conduit installed at required slope.
  - 4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- C. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
- D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping"
- E. Coordinate with CCSU standards.
- F. IP Addresses for any contractor-installed equipment will be furnished by CCSU. Only devices that have been configured with a CCSU provided IP Address, subnet mask, gateway address, etc. may be placed on the network, and only after receiving approval from CCSU.

## PART 2 - PRODUCTS

### 2.1 SLEEVES FOR PATHWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- C. Sleeves for Rectangular Openings: Galvanized sheet steel.
  - 1. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
    - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

### 2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Advance Products & Systems, Inc.
    - b. Calpico, Inc.

- c. Metraflex Co.
  - d. Pipeline Seal and Insulator, Inc.
- 2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of pathway or cable.
  - 3. Pressure Plates: Stainless steel. Include two for each sealing element.
  - 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

### 2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## PART 3 - EXECUTION

### 3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to top of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications' equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

### 3.2 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

- A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.



- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and pathway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry.
  - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants".
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- K. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

### 3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 270500

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Telecommunications mounting elements.
2. Backboards.
3. Telecommunications equipment racks and cabinets.
4. Telecommunications service entrance pathways.
5. Grounding.

B. Related Sections:

1. Division 27 Section "Communications Horizontal Cabling" for voice and data cabling associated with system panels and devices.

1.3 DEFINITIONS

- A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
- B. BICSI: Building Industry Consulting Service International.
- C. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel not exceeding 6 inches (152 mm) in width.
- D. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- E. LAN: Local area network.
- F. RCDD: Registered Communications Distribution Designer.
- G. Solid-Bottom or Nonventilated Cable Tray: A fabricated structure consisting of a bottom without ventilation openings within integral or separate longitudinal side rails.
- H. Trough or Ventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal rails and a bottom having openings sufficient for the passage of air and using 75 percent or less of the plan area of the surface to support cables.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Floor-mounted cabinets and cable pathways shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  2. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
  3. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.
- C. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
- D. Seismic Qualification Certificates: For floor-mounted cabinets, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each rack type. Identify components on which certification is based.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
1. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of RCDD/NTS and/or Commercial Installer, Level 2.

2. Installation Supervision: Installation shall be under the direct supervision of Registered Technician and/or Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
  3. Field Inspector: Currently registered by BICSI as RCDD and/or Commercial Installer, Level 2 to perform the on-site inspection.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- D. Grounding: Comply with ANSI-J-STD-607-A.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install equipment frames and cable trays until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and work above ceilings is complete.

#### 1.8 COORDINATION

- A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
  2. Record agreements reached in meetings and distribute them to other participants.
  3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
  4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.
- B. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

### PART 2 - PRODUCTS

#### 2.1 PATHWAYS

- A. General Requirements: Comply with TIA/EIA-569-A.

- B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
  - 1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
  - 2. Support brackets with cable tie slots for fastening cable ties to brackets.
  - 3. Lacing bars, spools, J-hooks, and D-rings.
  - 4. Straps and other devices.
- C. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.
- D. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

## 2.2 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels specified in Division 06 Section "Rough Carpentry."

## 2.3 EQUIPMENT FRAMES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. ADC.
  - 2. Aim Electronics; a brand of Emerson Electric Co.
  - 3. AMP; a Tyco International Ltd. company.
  - 4. Cooper B-Line, Inc.
  - 5. Hubbell Premise Wiring.
  - 6. KRONE Incorporated.
  - 7. Leviton Voice & Data Division.
  - 8. Middle Atlantic Products, Inc.
  - 9. Nordex/CDT; a subsidiary of Cable Design Technologies.
  - 10. Ortronics, Inc.
  - 11. Panduit Corp.
  - 12. Siemon Co. (The).
- B. General Frame Requirements:
  - 1. Distribution Frames: Freestanding and wall-mounting, modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
  - 2. Module Dimension: Width compatible with EIA 310 standard, 19-inch panel mounting.
  - 3. Finish: Manufacturer's standard, baked-polyester powder coat.
  - 4. The racks shall be assembled using paint-piercing grounding washers (Panduit Part no. RGW, or CSCU-approved substitute) and antioxidant (per the recommendations of the manufacturer).

- C. Floor-Mounted Racks: Modular-type, steel construction.
  - 1. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug, and a vertical power strip with plug to match CCSU furnished UPS output.
  - 2. Baked-polyester powder coat finish.
  - 3. 84" in height.
  
- D. Modular Wall Cabinets:
  - 1. Wall mounting.
  - 2. Aluminum construction.
  - 3. Suitable for Damp locations.
  - 4. Lockable front and/or rear doors.
  - 5. Louvered side panels.
  - 6. Cable access provisions top and bottom.
  - 7. Grounding lug.
  - 8. Rack or Roof-mounted, cooling unit and self-regulating heater.
  - 9. Power strip.
  - 10. All cabinets keyed alike.
  
- E. Cable Management for Equipment Frames:
  - 1. Metal, with integral wire retaining fingers.
  - 2. Baked-polyester powder coat finish.
  - 3. Vertical cable management panels shall have front and rear channels, with covers.
  - 4. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two rack units each.

## 2.4 GROUNDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.
  
- B. Telecommunications Main Bus Bar:
  - 1. Connectors: Mechanical type, cast silicon bronze, solderless compression and exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
  - 2. Ground Bus Bar: Copper, minimum 1/4 inch thick by 4 inches wide with 9/32-inch holes spaced 1-1/8 inches apart.
  - 3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.
  
- C. Comply with ANSI-J-STD-607-A.

## 2.5 LABELING

- A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

- A. Contact telecommunications service provider and arrange for installation of demarcation point, protected entrance terminals, and a housing when so directed by service provider.
- B. Install underground pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities" Article.

3.2 Install underground entrance pathway complying with Division 26 Section "Raceway and Boxes for Electrical Systems "INSTALLATION".

- A. Comply with NECA 1.
- B. Comply with BICSI TDMM for layout and installation of communications equipment rooms.
- C. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.
- D. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.3 FIRESTOPPING

- A. Comply with requirements in Division 07 Section "Penetration Firestopping. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.4 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with ANSI-J-STD-607-A.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.
  - 1. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.



3.5 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 26 Section "Identification for Electrical Systems." Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.
- B. See Division 27 Section "Communications Horizontal Cabling" for additional identification requirements. See Evaluations for discussion of TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2, Class 3, or Class 4 level of administration including optional identification requirements of this standard.
- C. Labels shall be preprinted or computer-printed type.

END OF SECTION 271100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
  - 1. Pathways.
  - 2. UTP cabling.
  - 3. 50/125-micrometer, optical fiber cabling.
  - 4. Coaxial cable.
  - 5. Multiuser telecommunications outlet assemblies.
  - 6. Cable connecting hardware, patch panels, and cross-connects.
  - 7. Telecommunications outlet/connectors.
  - 8. Cabling system identification products.
  - 9. Cable management system.

1.3 DEFINITIONS

- A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
- B. BICSI: Building Industry Consulting Service International.
- C. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel.
- D. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.
- E. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- F. EMI: Electromagnetic interference.
- G. IDC: Insulation displacement connector.
- H. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- I. LAN: Local area network.

- J. MUTOA: Multiuser telecommunications outlet assembly, a grouping in one location of several telecommunications' outlet/connectors.
- K. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- L. RCDD: Registered Communications Distribution Designer.
- M. Solid-Bottom or Nonventilated Cable Tray: A fabricated structure consisting of longitudinal side rails and a bottom without ventilation openings.
- N. Trough or Ventilated Cable Tray: A fabricated structure consisting of longitudinal side rails and a bottom having openings for the passage of air.
- O. UTP: Unshielded twisted pair.

#### 1.4 HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.
  - 1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
  - 2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
  - 3. Bridged taps and splices shall not be installed in the horizontal cabling.
  - 4. Splitters shall not be installed as part of the optical fiber cabling.
- B. A work area is approximately 100 sq. ft and includes the components that extend from the telecommunications outlet/connectors to the station equipment.
- C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet in the horizontal cross-connect.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

#### 1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. For coaxial cable, include the following installation data for each type used:

- a. Nominal OD.
- b. Minimum bending radius.
- c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration drawings and printouts.
4. Wiring diagrams to show typical wiring schematics, including the following:
  - a. Cross-connects.
  - b. Patch panels.
  - c. Patch cords.
5. Cross-connects and patch panels. Detail mounting assemblies and show elevations and physical relationship between the installed components. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:
  - a. Vertical and horizontal offsets and transitions.
  - b. Clearances for access above and to side of cable trays.
  - c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
  - d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

C. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.

D. Source quality-control reports.

E. Field quality-control reports.

F. Maintenance Data: For splices and connectors to include in maintenance manuals.

G. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings by an RCDD.

2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
  3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- B. Testing Agency Qualifications: An NRTL.
1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
  2. Smoke-Developed Index: 50 or less.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- F. Grounding: Comply with ANSI-J-STD-607-A.
- G. Warranty: A manufacturer's system warranty is required.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Test cables upon receipt at Project site.
1. Test optical fiber cables to determine the continuity of the strand end to end. Use optical loss test set.
  2. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
  3. Test each pair of UTP cable for open and short circuits.
- 1.9 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.
- B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.11 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
  - 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

PART 2 - PRODUCTS

2.1 PATHWAYS

- A. General Requirements: Comply with TIA/EIA-569-A.
- B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
  - 1. All cable support for this project will consist of raceways (underground and throughout the facility), cable tray (in the MER) and cable management on the rack.
- C. Cable Trays:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Cable Management Solutions, Inc.
    - b. Cablofil Inc.
    - c. Cooper B-Line, Inc.
    - d. Cope - Tyco/Allied Tube & Conduit.
    - e. GS Metals Corp.
  - 2. Cable Tray Materials: Metal, basket type, suitable for indoors, and protected against corrosion by electroplated zinc galvanizing, complying with ASTM B 633, Type 1, not less than 0.000472 inch thick.

- a. Trough Cable Trays: Nominally 6 inches wide.
  - b. Ladder Cable Trays: Nominally 18 inches wide, and a rung spacing of 12 inches.
- D. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."
1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.
  2. Conduit shall have no more than the equivalent of two 90-degree bends between junction or pull points.

## 2.2 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels.

## 2.3 UTP CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Belden CDT Inc.; Electronics Division.
  2. Berk-Tek; a Nexans company.
  3. CommScope, Inc.
  4. Draka USA.
  5. Genesis Cable Products; Honeywell International, Inc.
  6. KRONE Incorporated.
  7. Mohawk; a division of Belden CDT.
  8. Nordex/CDT; a subsidiary of Cable Design Technologies.
  9. Superior Essex Inc.
  10. SYSTIMAX Solutions; a CommScope, Inc. brand.
  11. 3M.
  12. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. Description: 100-ohm, 4-pair UTP, formed into 25-pair, binder groups covered with a blue thermoplastic jacket.
1. Comply with ICEA S-90-661 for mechanical properties.
  2. Comply with TIA/EIA-568-B.1 for performance specifications.
  3. Comply with TIA/EIA-568-B.2, Category 6.
  4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
    - a. Communications, General Purpose: Type CM or CMG.
    - b. Communications, Riser Rated: Type CMR, complying with UL 1666.
    - c. Communications, Limited Purpose: Type CMX.
- C. Color Code: Shall comply with CCSU standards.
1. Persona Locks: Purple.

2. CCTV: Pink.
3. Wireless: Yellow.
4. Data 1: Blue.
5. Data 2: Green.
6. POTS: Grey.
7. Fire Alarm: Red.
8. Temperature Control: White.

#### 2.4 UTP CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Technology Systems Industries, Inc.
  2. Dynacom Corporation.
  3. Hubbell Premise Wiring.
  4. KRONE Incorporated.
  5. Leviton Voice & Data Division.
  6. Molex Premise Networks; a division of Molex, Inc.
  7. Nordex/CDT; a subsidiary of Cable Design Technologies.
  8. Panduit Corp.
  9. Siemon Co. (The).
  10. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- C. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.
- D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
1. Number of Terminals per Field: One for each conductor in assigned cables.
- E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
1. Number of Jacks per Field: One for each four-pair UTP cable indicated, plus spares and blank positions adequate to suit specified expansion criteria.
- F. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
- G. Patch Cords: Factory-made, four-pair cables in 36-inch lengths; terminated with eight-position modular plug at each end.



1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
2. Patch cords shall have color-coded boots for circuit identification.

H. OSP Copper Backbone Cable shall incorporate 24 AWG solid copper conductors insulated with a polyvinyl chloride skin over expanded polyethylene with a gel-based (ETPR) filling compound. Conductors shall be twisted to form pairs and fully color-coded.

## 2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berk-Tek; a Nexans company.
2. CommScope, Inc.
3. Corning Cable Systems.
4. General Cable Technologies Corporation.
5. Mohawk; a division of Belden CDT.
6. Nordex/CDT; a subsidiary of Cable Design Technologies.
7. Optical Connectivity Solutions Division; Emerson Network Power.
8. Superior Essex Inc.
9. SYSTIMAX Solutions; a CommScope, Inc. brand.
10. 3M.
11. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description:

1. Inter-Building Fiber: Type OS2 loose-tube, 48-strand with type LC connectors. Install in inner-duct installed in specified conduits.
2. Intra-Building Fiber (from ER to TR): Multimode, Type OM4, 6-strand, nonconductive, tight buffer, optical fiber cable with Type LC connectors.

C. Jacket:

1. Jacket Color: Blue for single-mode cable, Aqua for multi-mode cable.
2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches.

## 2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ADC.
2. American Technology Systems Industries, Inc.
3. Berk-Tek; a Nexans company.
4. Corning Cable Systems.
5. Dynacom Corporation.
6. Hubbell Premise Wiring.

7. Molex Premise Networks; a division of Molex, Inc.
  8. Nordex/CDT; a subsidiary of Cable Design Technologies.
  9. Optical Connectivity Solutions Division; Emerson Network Power.
  10. Siemon Co. (The).
- B. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.
1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.
- C. Patch Cords: Factory-made, dual-fiber cables in 36-inch lengths.
- D. Cable Connecting Hardware:
1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.
  2. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.

## 2.7 COAXIAL CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Alpha Wire Company.
  2. Belden CDT Inc.; Electronics Division.
  3. Coleman Cable, Inc.
  4. CommScope, Inc.
  5. Draka USA.
- B. Cable Characteristics: Broadband type, recommended by cable manufacturer specifically for broadband data transmission applications. Coaxial cable and accessories shall have 75-ohm nominal impedance with a return loss of 20 dB maximum from 7 to 806 MHz.
- C. RG-6/U: NFPA 70, Type CATV or CM.
1. No. 16 AWG, solid, copper-covered steel conductor; gas-injected, foam-PE insulation.
  2. Double shielded with 100 percent aluminum-foil shield and 60 percent aluminum braid.
  3. Jacketed with black PVC or PE.
  4. Suitable for indoor installations.
- D. NFPA and UL compliance, listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1655 and with NFPA 70 "Radio and Television Equipment" and "Community Antenna Television and Radio Distribution" Articles. Types are as follows:
1. CATV Cable: Type CATV.
  2. CATV Riser Rated: Type CATVR, complying with UL 1666.
  3. CATV Limited Rating: Type CATVX.

2.8 COAXIAL CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Aim Electronics; a brand of Emerson Electric Co.
  2. Leviton Voice & Data Division.
  3. Siemon Co. (The).
- B. Coaxial-Cable Connectors: Type F.

2.9 CONSOLIDATION POINTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Technology Systems Industries, Inc.
  2. Chatsworth Products, Inc.
  3. Dynacom Corporation.
  4. Hubbell Premise Wiring.
  5. Molex Premise Networks; a division of Molex, Inc.
  6. Nordex/CDT; a subsidiary of Cable Design Technologies.
  7. Ortronics, Inc.
  8. Panduit Corp.
  9. Siemon Co. (The).
- B. Description: Consolidation points shall comply with requirements for cable connecting hardware.
1. Number of Terminals per Field: One for each conductor in assigned cables.
  2. Number of Connectors per Field:
    - a. One for each four-pair UTP cable indicated.
  3. Mounting: Recessed in ceiling or Wall.
  4. NRTL listed as complying with UL 50 and UL 1863.
  5. When installed in plenums used for environmental air, NRTL listed as complying with UL 2043.

2.10 MULTIUSER TELECOMMUNICATIONS OUTLET ASSEMBLY (MUTOA)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Chatsworth Products, Inc.
  2. Hubbell Premise Wiring.
  3. Molex Premise Networks; a division of Molex, Inc.
  4. Nordex/CDT; a subsidiary of Cable Design Technologies.
  5. Ortronics, Inc.

6. Panduit Corp.
7. Siemon Co. (The).

B. Description: MUTOAs shall meet the requirements for cable connecting hardware.

1. Number of Terminals per Field: One for each conductor in assigned cables.
2. Number of Connectors per Field:
  - a. One for each four-pair UTP cable indicated.
3. Mounting: Recessed in Wall.
4. NRTL listed as complying with UL 50 and UL 1863.
5. Label shall include maximum length of work area cords, based on TIA/EIA-568-B.1.
6. When installed in plenums used for environmental air, NRTL listed as complying with UL 2043.

## 2.11 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular RJ45. Comply with TIA/EIA-568-B.1.
- B. Workstation Outlets: Multi-port-connector assemblies mounted in single-gang faceplate.
  1. Metal Faceplate: Stainless steel, complying with requirements in Division 26 Section "Wiring Devices."
  2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.
    - a. Flush mounting jacks, positioning the cord at a 45-degree angle.
  3. Legend: Machine printed, in the field, using adhesive-tape label.
  4. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

## 2.12 GROUNDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Comply with ANSI-J-STD-607-A.

## 2.13 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

2.14 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.
- C. Factory test UTP cables according to TIA/EIA-568-B.2.
- D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.
- E. Factory-sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.
- F. Cable will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays except within consoles and cabinets.
  - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
  - 2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF PATHWAYS

- A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.
- B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.
- C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.
- D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

- F. Pathway Installation in Communications Equipment Rooms:
1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
  2. Install cable trays to route cables if conduits cannot be located in these positions.
  3. Secure conduits to backboard when entering room from overhead.
  4. Extend conduits 3 inches above finished floor.
  5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.
- G. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly and form smooth gap-free corners and joints.

### 3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
1. Comply with TIA/EIA-568-B.1.
  2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
  3. Install 110-style IDC termination hardware unless otherwise indicated.
  4. MUTOA shall not be used as a cross-connect point.
  5. Consolidation points may be used only for making a direct connection to telecommunications outlet/connectors:
    - a. Do not use consolidation point as a cross-connect point, as a patch connection, or for direct connection to workstation equipment.
    - b. Locate consolidation points for UTP at least 49 feet from communications equipment room.
  6. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
  7. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
  8. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
  9. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
  10. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
  11. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
  12. In the communications equipment room, install a 10-foot- long service loop on each end of cable.

13. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
  1. Comply with TIA/EIA-568-B.2.
  2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.
- D. Optical Fiber Cable Installation:
  1. Comply with TIA/EIA-568-B.3.
  2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.
- E. Outdoor Coaxial Cable Installation:
  1. Install outdoor connections in enclosures complying with NEMA 250, Type 4X. Install corrosion-resistant connectors with properly designed O-rings to keep out moisture.
  2. Attach antenna lead-in cable to support structure at intervals not exceeding 36 inches.
- F. Group connecting hardware for cables into separate logical fields.
- G. Separation from EMI Sources:
  1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
  2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
    - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
  3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
    - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
  4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
    - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
  5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.

6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

### 3.4 FIRESTOPPING

- A. Comply with requirements in Division 07 Section "Penetration Firestopping."
- B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

### 3.5 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with ANSI-J-STD-607-A.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground. Bus bar shall be minimum 20" long, 1/4" thick.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

### 3.6 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems." All cables, regardless of length, shall be marked and/or numbered at both ends.
  1. Administration Class: 2.
  2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
- B. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. Indicate Room #, Panel # and Jack ID #.
- C. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2 level of administration, including optional identification requirements of this standard.
- D. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.



- E. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Owner.
- F. Cable and Wire Identification:
1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
  2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
  3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
  4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
    - a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
    - b. Label each unit and field within distribution racks and frames.
  5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
  6. Uniquely identify and label work area cables extending from the MUTOA to the work area. These cables may not exceed the length stated on the MUTOA label.
- G. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
1. Cables use flexible vinyl or polyester that flex as cables are bent.

### 3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments and inspect cabling connections for compliance with TIA/EIA-568-B.1.
  2. Visually confirm Category 6, marking of outlets, cover plates, outlet/connectors, and patch panels.

3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
  - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
5. Optical Fiber Cable Tests:
  - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
  - b. Link End-to-End Attenuation Tests:
    - 1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
    - 2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.
6. UTP Performance Tests:
  - a. Test for each outlet and MUTOA. Perform the following tests according to TIA/EIA-568-C.0. Utilize a Level 3 Fluke DTX Networks Cable Tester. Test records shall verify a "PASS" on each cable and display the specified parameters—comparing test values with standards based "templates" integral to the unit.
    - 1) Wire map.
    - 2) Length (physical vs. electrical, and length requirements).
    - 3) Attenuation.
    - 4) Near-end crosstalk (NEXT) loss.
    - 5) ACR.
    - 6) Power sum near-end crosstalk (PSNEXT) loss.
    - 7) Equal-level far-end crosstalk (ELFEXT).
    - 8) Power sum equal-level far-end crosstalk (PSELFEXT).
    - 9) Return loss.
    - 10) Propagation delay.
    - 11) Delay skew.
7. Optical Fiber Cable Performance Tests: Perform optical fiber Optical Attenuation ("Insertion Loss" Method) test.

8. Coaxial Cable Tests: Conduct tests according to Division 27 Section "Master Antenna Television System."
9. Final Verification Tests: Perform verification tests for UTP and optical fiber systems after the complete communications cabling and workstation outlet/connectors are installed.
  - a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
  - b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.
- C. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
- D. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. A manufacturer's system warranty is required.

### 3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

### 3.9 WARRANTY

- A. A manufacturer's warranty shall be furnished at the completion of the project which guarantees system performance, the installed components, and the installation integrity of the horizontal and backbone cabling. This warranty must be valid for a minimum of 20 years. An example includes the Hubbell Mission Critical Warranty or equivalent.

END OF SECTION 271500

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Termination Hardware for telephone and fiber equipment.
  - 2. Miscellaneous Hardware.
  - 3. Callbox system additions and alternate for new system.
  - 4. Security Camera equipment.

### 1.3 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.
- C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- D. EMI: Electromagnetic interference.
- E. IDC: Insulation displacement connector.
- F. LAN: Local area network.
- G. MUTOA: Multiuser telecommunications outlet assembly, a grouping in one location of several telecommunications' outlet/connectors.
- H. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- I. RCDD: Registered Communications Distribution Designer.
- J. UTP: Unshielded twisted pair.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
  - 1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
  - 2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
  - 3. Wiring diagrams to show typical wiring schematics, including the following:
    - a. Cross-connects.
    - b. Patch panels.
    - c. Patch cords.
  - 4. Cross-connects and patch panels. Detail mounting assemblies and show elevations and physical relationship between the installed components.
- C. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
- D. Source quality-control reports.
- E. Field quality-control reports.
- F. Maintenance Data: For active electronics to include in maintenance manuals.
- G. Software and Firmware Operational Documentation:
  - 1. Software operating and upgrade manuals.
  - 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
  - 3. Device address list.
  - 4. Printout of software application and graphic screens.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
  - 1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings, Cabling Administration Drawings, and field-testing program development by an RCDD.
  - 2. Installation Supervision: Installation shall be under the direct supervision of Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
  - 3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install equipment and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
  - 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S EQUIVALENTS

- A. Any alternate equipment, submitted under this section, must be 100% compatible in features and functionality with the equipment specified here and must be approved by the Owner or their appointed Project Manager as an approved equal. The products expressed within this specification and described on the Drawings are based on the Leviton/Mohawk solution of products. Other Approved manufacturers are Ortronics/Berktek, CommScope "Uniprise" and the Hubbell/General solutions. Callbox system shall match Hospital standard.

2.2 TERMINATION HARDWARE

- A. Faceplates
  - 1. Leviton Part # 42080-6\*S – Single gang faceplate w/6 openings, used for mounting of 8P8C (RJ45) connector modules, "F" connector bulkhead and blank modules. Color: Stainless Steel.
- B. Category 6 Jacks
  - 1. Leviton Part # 61110-R\*6 – Single 8P8C (RJ45) Category 6 connector module (T568B wiring) used for termination of Category 6 workstation cables. Color: TBD
- C. Wall Phone Faceplate: Leviton Part # 4108W-1SP– Stainless Steel Wall Phone Plate.

- D. Blank Modules: Leviton Part # 41084-B\*B- Blank module used to fill the unused unit spaces in the single gang faceplate. Color: TBD
  
- E. Patch Panels
  - 1. Leviton Part #69586-U48 – 48 Port patch panel used in Tele Communication Rooms for termination of Category 6, RJ45 jacks from workstation cables.
  - 2. Leviton Part #69586-U24 – 24 Port patch panel used in Tele Communication Rooms for termination of Category 6, RJ45 jacks – for Telephone.
  - 3. Leviton Part #41DBR-1F4 – 100 Pair, 110 style, 19” rack mounting kit w/C-4 clips, used in Tele Communication Rooms for termination of the Voice distribution cabling.
  
- F. Fiber Optic Hardware
  - 1. Leviton Part # 5P230-OHB – 1RU, Fiber optic enclosure with 6 Duplex SC adapter plates. 19” Rack mountable used for termination of Data Backbone Distribution.
  - 2. Leviton Part # 5T000-00T – Fiber Optic Splicing Tray.
  - 3. Leviton Part # 49886-DSC – SC type Fiber Optic Connector. 25 pack.
  - 4. Leviton Part # 5W170-00N – Opt-X Wall Mount Enclosure.
  - 5. Leviton Part # 5F100-6BC – 6 Duplex SC type Fiber Optic Adapter Plate used for termination of Data Backbone Distribution within the Electrical Room #105.
  
- G. Voice Termination Blocks
  - 1. Leviton Part # 41NB2-1F4 – 100 Pair 110 punch block with legs used for termination of Voice Phone distribution cabling in Main Equipment Room.
  
- H. Video Termination Products
  - 1. Leviton Part # 41084-F\*F- "F" Connector Module RG6U
  - 2. Leviton Part # 40985-CPF – F connector – RG6U
  - 3. Leviton Part # 40987-2 – 2-Way Splitter - RG6U
  - 4. Leviton Part # 47690-008 – 8-Way Splitter - RG6U
  - 5. Leviton Part # 40984 – 75ohm Terminator - RG6U
  - 6. Leviton Part # TBD – F connector – RG611U

## 2.3 SECURITY CAMERA EQUIPMENT

- A. Product Data. The camera equipment listed is per CCSU standards.
  - 1. Fixed Camera; Verint 4530FDW. Provide compatible pipe and pole mount kits.
  - 2. Pan/Tilt/Zoom Camera; Verint V7620. Provide with corner mount kit CM-V35-V45-FD-FDW.
  - 3. Plate Tag Camera; Bosch PBNERL2R52.
  - 4. Video Recorder; Dell PowerEdge R330 with Dell Storage SATA.
  - 5. Storage Unit; Nexsan 180 Drive.
  - 6. Cable Extender; Veracity Longspan VLS-IP-B-C. For cable runs over 300 feet.

## 2.4 MISCELLANEOUS

- A. 7' High, 19" 2-Post Rack: Cooper B-Line Part # SB556-084-XUFB - 19" 2-Post Rack, Color: black.
- B. Wire Managers: Leviton Part # 49253-LPM – Wire management panel used for horizontal wire management of patch cords.
- C. Voice Patch Cables: NetSource #HYDM1245-5 – 25 pair, RJ-21X, 90\* Hydra male connector with 5' long pigtails used to cross connect the 110 style patch panels.
- D. Power Strips: Leviton Part # 5500-192 – Power strip - 20 Amp electrical outlets to be mounted on 19" equipment rack.
- E. Firestop: STI Firestop Part # SSB24 – Firestop putty used to seal any penetrations of sleeves or conduits used for communications cabling.
- F. Ladder Rack: Cooper B-Line Part # SB17U12BFB – 12" Wide Ladder Rack, Color: Black.
- G. Grounding Kits: Chatsworth Part # 08009-001 – Grounding kits used to attach #6 ground wire to equipment racks and Ladder racks.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. This Bid shall include all shipping charges and costs associated with the delivery and installation of the new equipment described within this specification to the customer facility, transportation of the equipment from the customer loading dock to the designated Main Equipment Room as indicated by the owner.
- B. Software installation and configuration shall include all software products, specified under this section, shall be included in the pricing submitted for this section and IT coordination drawings.
- C. External Connections – Patch Cords  
Category 6 patch cords shall be furnished and installed for each port of all switches at both the closet and workstation ends. All external connections shall be performed by the awarded contractor.

### 3.2 WIRING METHODS

- A. Wiring Method: Install cables in raceways and J-HOOKS except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.
  - 1. Install plenum cable in environmental air spaces, including plenum ceilings.



2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

- B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Wiring within handholes: No splices shall be made in any handholes subject to water. All cable splices are to be made in handholes or boxes within the building not subject to water.

### 3.3 FIRESTOPPING

- A. Comply with requirements in Division 07 Section "Penetration Firestopping."
- B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

### 3.4 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with ANSI-J-STD-607-A.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

### 3.5 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
  - 1. Administration Class: 2.
  - 2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
- B. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
  2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
  3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
  4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
    - a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
    - b. Label each unit and field within distribution racks and frames.
  5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
  6. Uniquely identify and label work area cables extending from the MUTOA to the work area. These cables may not exceed the length stated on the MUTOA label.
- C. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
1. Cables use flexible vinyl or polyester that flex as cables are bent.

### 3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel in equipment operations.

END OF SECTION 271600

PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. The work in this section includes furnishing, installing and commissioning all access control hardware as hereinafter specified or obviously necessary for all swinging doors.

B. RELATED DOCUMENTS

1. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division I specification sections apply to this section.

C. RELATED SECTIONS

1. 081113 Metal Doors and Frames
2. 081416 Flush Wood Doors
3. 087100 Door Hardware
4. Division 26 Electrical
5. Division 27 Communications

1.2 REFERENCES

A. STANDARDS

1. AJA A201 1997 General Conditions of the Contract
2. ANSI A156.1 Butts and Hinges
3. ANSI A156.13 Bored and Preassembled Locks and Latches
4. ANSI A156.3 Exit Devices
5. ANSI A156.7 Template Hinge Dimensions
6. ANSI A156.18 Material and Finishes
7. UL10C Positive Pressure Fire Tests of Door Assemblies
8. UL294 Access Control Systems
9. UL1076 Proprietary Burglar Alarm Units and Systems

B. CODES

1. NFPA 101 Life Safety Code
2. ANSI A117.1 Accessible and Usable Buildings and Facilities
3. ADA Americans with Disabilities Act

1.3 SUBMITTALS

A. GENERAL REQUIREMENTS

1. Submit copies of finish hardware schedule in accordance with Division I, General

Requirements.

B. SCHEDULES AND PRODUCT DATA

1. Schedules to be in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Hardware schedule shall be submitted within two (2) weeks from date the purchase order is received by the finish hardware supplier. Furnish four (4) copies of revised schedules after approval for field and file use. Note any special mounting instructions or requirements with the hardware schedule. Schedules to include the following information:
  - a. Location of each hardware set cross-referenced to indications on drawings, both on floor plans and in door and frame schedule.
  - b. Handing and degree of swing of each door.
  - c. Door and frame sizes and materials.
  - d. Keying information.
  - e. Type, style, function, size, and finish of each hardware item.
  - f. Elevation drawings and operational descriptions for all electronic openings.
  - g. Name and manufacturer of each hardware item.
  - h. Fastenings and other pertinent information.
  - i. Explanation of all abbreviations, symbols and codes contained in schedule
  - j. Mounting locations for hardware when varies from standard.
2. Submit catalog cuts and/or product data sheets for all scheduled access control hardware.
3. Submit copy of manufacturer's official certification or accreditation document indicating proof of status as a qualified and authorized provider of the primary access control components.

C. SAMPLES

1. Upon request, samples of each type of hardware in finish indicated shall be submitted. Samples are to remain undamaged and in working condition through submittal and review process. Items will be returned to the supplier or incorporated into the work within limitations of keying coordination requirements.

D. TEMPLATES

1. Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.

E. ELECTRONIC HARDWARE SYSTEMS

1. Provide complete wiring diagrams prepared by an authorized factory employee for each opening requiring electronic hardware, except openings where only magnetic hold-open devices are specified. Provide a copy with each hardware schedule submitted after approval.
2. Provide complete operational descriptions of electronic components listed by opening in the hardware submittals. Operational descriptions to detail how each electrical

component functions within the opening incorporating all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval.

3. Provide elevation drawings of electronic hardware and systems identifying locations of the system components with respect to their placement in the door opening. Provide a copy with each hardware schedule submitted for approval.
4. Prior to installation of electronic hardware, arrange conference between supplier, installers and related trades to review materials, procedures and coordinating related work.
5. The electrical products contained within this specification represent a complete engineered system. If alternate electrical products are submitted, it is the responsibility of the distributor to bear the cost of providing a complete and working system including re-engineering of electrical diagrams and system layout, as well as power supplies, power transfers and all required electrical components. Coordinate with electrical engineer and electrician to ensure that line voltage and low voltage wiring is coordinated to provide a complete and working system.
6. For each item of electrified hardware specified, provide standardized molex plug connectors to accommodate up to twelve (12) wires. Molex plug connectors shall plug directly into through-door wiring harnesses, frame wiring harnesses, electric locking devices and power supplies.

F. OPERATIONS AND MAINTENANCE MANUALS

1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
  - a. Approved hardware schedule, catalog cuts and keying schedule.
  - b. Hardware installation and adjustment instructions.
  - c. Manufacturer's written warranty information.
  - d. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

1.4 QUALITY ASSURANCE

A. SUBSTITUTIONS

1. No substitution on any of the access control products specified in this section are allowed.

B. ACCESS CONTROL SUPPLIER

1. Supplier/Dealers, verifiably authorized and in good standing with the primary product manufacturers, with a minimum [3] years experience supplying integrated access control systems similar in material, design, and scope to that indicated for this Project and whose work has resulted in construction with a proven record of successful in-service performance.

C. ACCESS CONTROL INSTALLER QUALIFICATIONS

1. Systems Integrators, verifiably factory trained and certified by the primary product manufacturers, with a minimum [3] years documented experience installing complete

integrated access control systems similar in material, design, and scope to that indicated for this Project and whose work has resulted in construction with a proven record of successful in-service performance. Qualifications include, but are not necessarily limited, to the following:

- a. References: Provide a list of references for similar projects including contact name, phone number, name and type of project.
  - b. Professional Staffing: Firms to have a dedicated access control systems integration department with full time, experienced professionals on staff experienced in providing on site consulting services for both electrified door hardware and integrated access control systems installations.
  - c. Factory Training: Installation and service technicians are to be competent factory trained and certified personnel capable of maintaining the system.
  - d. Service Center: Firms to have a service center capable of providing training, in-stock parts, and emergency maintenance and repairs at the Project site with 24-hour/7-days a week maximum response time.
2. Persona IP-Enabled Access Control products are required to be supplied and installed only through designated ASSA ABLOY "Certified Integrator" (CI) accounts.

D. FIRE-RATED OPENINGS

1. Provide door hardware for fire-rated openings that comply with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed by Underwriters Laboratories (UL) or Warnock Hersey (WH) for use on types and sizes of doors indicated.
2. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with door manufacturers to ensure that total opening engineering is compatible with UL1QC Standard for Positive Pressure Fire Tests of Door Assemblies.
  - a. Hardware required for fire doors shall be listed with Underwriters Laboratories for ratings specified.
  - b. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.

1.5 DELIVERY, STORAGE AND HANDLING

A. MARKING AND PACKAGING

1. Properly package and mark items according to the approved access control hardware schedule, complete with necessary screws and accessories, instructions and installation templates for spotting mortising tools. Contractor shall check deliveries against accepted list and provide receipt for them, after which he is responsible for storage and care. Any shortage or damaged good shall be made without cost to the owner.
2. Packaging of door hardware is the responsibility of the supplier. As hardware supplier receives material from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set and door numbers to match the approved hardware schedule. Two or more identical sets may be packed in same container.

B. DELIVERY

1. The supplier shall deliver all hardware to the project site as required to meet the project schedule.

C. STORAGE

1. Do not store electronic access control hardware, software or related accessories at Project site without prior authorization.
  - a. Access control firmware and software: Where approved and directed, inventory upon receipt and store electronic access control equipment in a secure, temperature and humidity controlled environment in original manufacturer's sealed containers.
2. If authorized provide secure lock-up for access control hardware delivered to the Project, but not yet installed. Control handling of access control hardware items that are not immediately replaceable so that completion of work will not be delayed by hardware losses both before and after installation.

1.6 COORDINATION

- A. Coordinate quantity and arrangement of assemblies with ceiling space configuration and with components occupying ceiling space, including structural members, pipes, air-distribution components, raceways, cable trays, recessed lighting fixtures, and other items.
- B. Access Control System Electrical Coordination: Coordinate the layout and installation of scheduled electrified door hardware, and related access control equipment, with required connections to source power junction boxes, power supplies, detection and monitoring hardware and fire alarm system.
- C. Door Hardware Interface: The access control system to interface and be connected to electronic door control hardware (electromechanical locks, electric strikes, magnetic locks, door position switches, other monitoring contacts, and related auxiliary control devices) as described under Division 8 "Door Hardware". Coordinate the installation and configuration of specified door hardware being monitored or controlled with the controls, software and access control hardware specified in this Section.

1.7 WARRANTY

- A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of one (1) year commencing on the date of final completion and acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner.
  1. Exit Devices: Five (5) years
  2. Proximity Locksets: Two (2) years
- B. Access Control Software Upgrades: Version upgrades and "fix" releases to the access control system software are available at no extra charge as long as the version of software provided

under this specification remains the current manufacturer's version or for up to (2) years after a new version release.

1. Major access control software revisions that provide new functionality to the product provided free of charge for up to one (1) year from the date of substantial completion.
2. Access control system software is to be upgradable as may be required or as necessary, to expand and manage the owner's site or sites. Upgrades are to be offered at a published flat fee for the primary system software, with single license modules included in the primary fee structure. System upgrades offered at a costing structure based upon the original number of licensed modules issued, or on those to be purchased at a future date, are not allowed.
3. As part of the submittal package, provide a list of available software upgrades and/or expansions modules. List to identify related costs for upgrades, or expansions to the original system, up to the next qualifying operational level.

## 1.8 ACCESS CONTROL SCOPE OF WORK

- A. Furnish and install at the indicated locations the specified electrified and integrated door hardware and access control firmware and software for a completely operational access control and security site management system. System includes, but is not necessarily limited, to the following:
1. Electrified integrated card reader locks and exit hardware, permanent override cylinders, network control processors, reader controller panels, I/O monitor/control interfaces, door position switches, remote card readers, keypads, and display terminals, access cards and credentials, system application software, special tools, operating manuals, and required cabling and accessories as detailed below and listed in the Hardware Sets at the end of Part 3.
    - a. Provide the appropriate number of reader controller panels and I/O monitoring/control expansion interfaces as needed to handle the number of card readers, locking devices, door status devices, and identified alarm inputs specified in this section, and as shown on the security drawings.
    - b. Provide manufacturer approved integrated card reader locks, exit hardware, and remote [mullion, jamb, wall] mounted card readers, keypads, and display terminals that are functionally compatible with the specified access control equipment interfaces.
  2. Access control system equipment to be installed in an enclosure box compatible with the specified components. This enclosure to include, but is not necessarily limited to, the network control processor, I/O monitor/control interface panels, power supplies, terminal strips, wire ducts, keyed lock cylinder, integrated outlet for A/C power, and standoffs.
    - a. Enclosure box to be located in the designated IT/Telecom room(s) with connection to the campus wide local area network for communication back to the central server host.
  3. Owner to provide the following:



- a. Computer hardware and peripherals to be from an approved, major line computer manufacturer. The following manufacturers will be considered "pre-approved", however, specific information detailing compliance with the manufacturer's requirements must be included within the project submittal package as specified.
    - 1) Compaq
    - 2) Dell
    - 3) Hewlett-Packard
    - 4) IBM
  - b. Central Server Host Computer:
    - 1) System Server to include the following minimal requirements: Windows Server 2003 (Service Pack I or higher) or later Operating System, Intel Pentium IV I GHz (equivalent or greater), SQL Server 2005 Express Edition or SQL 2005, 1GB Ram or larger, 120GB hard disk space available or more as needed, CRT or LCD minimum 15" display Monitor, CD/RW Drive. Single serial port, or multiple USB ports, and one parallel port, keyboard and mouse.
  - c. Client Workstations:
    - 1) Client Workstation to include the following minimal requirements: Windows XP Professional (Service Pack 2 or higher) or Windows Vista Business, Intel Pentium III 500 MHz (equivalent or greater), SQL Server 2000 Client Access License, 1GB Ram or larger, 30GB hard disk space available or more as needed, CRT or LCD minimum 15" display Monitor, CD/RW Drive. Single serial port, or multiple USB ports, and one parallel port, keyboard and mouse.
  - d. Owner will be responsible for ensuring that each computer hardware component includes the required interfaces, expansion boards, and peripherals that will be necessary to allow the system to operate as described within this specification and as indicated on the drawings.
  - e. Power Sourcing and Network Switches: Quantity as required to accommodate installed access control (and video surveillance) devices.
  - f. Network Control Processor Connections:
    - 1) LAN/Ethernet communication ports (jacks) and network interface cards as needed, CAT5e cabling from network router/switch to network control processor, outlet and cover plates and/or patch cables required for network connection within each designated IT/Telecom room.
    - 2) Required static IP addresses. (
4. Power Supplies, including battery back up and separately fused surge protection, required for the electrified door hardware and access control equipment.
  5. Installation, final configuration and commissioning of electrified door and access control system hardware, communication firmware, power supplies and related accessories.
  6. System application software including installation, programming, and end user training of the access control system demonstrating operating, repair, and maintenance procedures.

Include no fewer than 16 hours of on-site central server training for designated personnel (facilities maintenance, security, IT, administration) by a factory certified representative.

- a. Include minimum of 8 hours of Client Software Application (client workstation) training at each of the remote installed facilities for local administrative staff.
7. Provide manufacturer required power controllers, interface boards, and programming that may be required for approved electric latch retraction exit devices supplied under this Section.
  8. Electrical contractor, Division 26, to provide the following:
    - a. Source power wiring (120VAC) as required for the electrified locking and access control hardware, equipment, accessories and power supplies. This includes quad outlets as required on a dedicated circuit in the designated IT/Telecom room(s) and the related conduit, stub-in, junction boxes and connectors required for the source power delivery and connections.
    - b. Provide required conduit, stub-in, junction and back boxes for both the electrified locking hardware and access control equipment at each of the access controlled or monitored openings per plan drawings and specs. Supply and install conduit between each of the aforementioned devices and between the electrical junction boxes, power supplies and access control equipment located on or above the door opening.
      - 1) At wall mounted remote readers, provide conduit on the secured side of the door, 36" from the finish floor and 6" from the edge of the frame, to the related power supplies and access control equipment.
      - 2) At electrical hardware power transfers provide conduit on the secured side of the opening from the power transfer, thru-wire hinge, or serviceable panel location on the frame jamb to the related power supplies and access control equipment.
    - c. Electrical Contractor to provide all 120VAC cabling connections and terminations from the electrical junction boxes to these electrical devices.
  9. Access Control System Integrator to provide the following:
    - a. Low voltage wiring (12/24VDC) and communication cabling (RS-232/RS-485) from network control processors to reader controllers, I/O monitor/control interface panels, electrified and integrated locking hardware, remote card readers, keypads, or display terminals, monitoring and signaling switches, and power supplies. Work includes related connectors, final terminations, and hook-ups required for a complete and functional access controlled opening in accordance with applicable codes and specified system operational narratives.
  10. Full and seamless integration of the site intrusion alarm service and motion detector systems, Division 28 if applicable, with the installed site access control system software.
  11. Final connections to fire alarm system, if required, by electrical and fire alarm system contractors.
  12. Provide permits, submittals and approvals required by the authority having jurisdiction, prior to commencing with work.

PART 2 - PRODUCTS

2.1 SYSTEM ARCHITECTURE - ACCESS CONTROL AND SITE MANAGEMENT SYSTEM (ACSMS)

- A. General: All access control hardware is to tie into the owners' existing Persona site management system.

2.2 MANUFACTURERS

- A. Only manufacturers as listed below shall be accepted. Obtain each type of finish hardware and access control (hinges, latch and locksets, proximity locksets, access control software and components, exit devices, door closers, etc.) from a single manufacturer.

2.3 MATERIALS

A. SCREWS AND FASTENERS

1. All required screws shall be supplied as necessary for securing finish hardware in the appropriate manner. Thru-bolts shall be supplied for exit devices and door closers where required by code and the appropriate blocking or reinforcing is not present in the door to preclude their use.

B. HANGING DEVICES

1. POWER TRANSFER HINGES

- a. Power-over-Ethernet (PoE) Data Hinges: Provide PoE hinges allowing for both power and Ethernet data to be transferred from an incoming source to the door opening and linked with electrified door hardware via Molex™ standardized plug connectors and wire harnesses.

- 1) Each hinge features two 6-position and two 4-position Molex connectors, 9 multistrand wires; 2 twisted pairs (26 AWG), 4 straight conductors (28 gauge) and 1 straight conductor (22 AWG) with concealed plug connectors eliminating the need for separate or exposed wiring. Rated 350 mA continuous @ 48 volts DC nominal, the hinge is capable of two PoE wiring configurations:

- a) Power over Data (5 wire): Power and Data supplied together over the 2 twisted (26 AWG) pairs. The 22 AWG conductor is used for the earth ground connection.
- b) Data with Power over Spares (9 wire): Data over 2 twisted (26 AWG) pairs with Power over spare pairs (4 straight 28 AWG conductors). The 22 Awg conductor is used for earth ground connection.

1. Specified Manufacturer: McKinney PoE Series  
2. Approved Substitutes: NONE

C. ACCESS CONTROL DEVICES - ON LINE ELECTRONIC ACCESS CONTROL SYSTEM

1. PoE CYLINDRICAL LOCKSETS

a. Power-over-Ethernet (PoE) Access Control Cylindrical Locks.

- 1) BI-IMA certified extra heavy duty, lever type cylindrical lock conforming to ANSI 156.2 Series 4000, Grade I standard and ANSI A117.1 accessibility guidelines. Motorized locking control of lever handle trim (solenoids not acceptable) with ½" anti-friction deadlocking latch, UL listed and labeled for up to 3 hour fire rated openings.
- 2) Power-over-Ethernet intelligent access control locking devices interface using standard IEEE 802.3af Ethernet for data and power communication directly from the locking unit back to a host server over an existing or newly installed TCP/IP network facilitating centralized control via a Software Development Kit (SOK) to an online electronic access control system without the need for additional interfaces or components (excluding PoE Endspan and Midspan devices). Provide access control products with non-volatile memory.
- 3) Fully-encrypted AES-128 (IEEE 802.3af) communication between IP Enabled lock and electronic access control system platform via SOK. Programmable time zone periods, blocked holidays, automatic unlock with or without first entry, minimum of 2,400 user codes and the ability to audit the last 10,000 transactions (event type, date, time, user ID and name). Distributed intelligence allows stand alone functional operation of lock in absence of network communication or slowdown allowing for system operational redundancy.
- 4) Integrated reader supports High Coercivity (HiCo) magnetic swipe credentials, HID® 125 kHz proximity credentials or ISO 14443 A/B and ISO 15693 13.56 MHz contactless credentials: HID® iCLASS / iCLASS SE (full authentication, all formats), MIFARE Classic and DESFire EV] (full authentication, all formats); NFC (Near Field Communications) and HID® SIO-Enabled™.
  - a) Valid/ Invalid credential presentation viewable by means of LED indicators on outside escutcheon.
  - b) Dual factor keypad authentication function optional.
- 5) Environmental Conditions: Conformally coated weather resistant electronic controller shall meet the following minimum requirements:
  - a) Operating temperature: -31 to 150 degrees F (-35 to 65 degrees C)
  - b) Operating humidity: 5% to 95% relative humidity non-condensing
  - c) Weatherized design suitable to withstand harsh environments with a certified rating of IP55
- 6) Configuration: Programming of time zone periods, blocked holidays, automatic unlock with or without first entry, and listing 10,000 event transaction history consisting of event type, date, time, user ID and name is required.

- a) Provide network and lock configuration CD tool kit for initial lock set-up and programming via USB connection.
  - b) Monitoring: Software accessible monitoring (via SOK) of inside lever handle (Request-to-Exit), door position switch (DPS) integral to the lock (door open/closed status), forced door, unknown card, door held open, battery and tamper.
  - c) Standard privacy function initiated from push button on inside escutcheon and cancelled upon activation of valid Request-To-Exit (REX) or user defined credentials.
    - I. Activation of privacy function is indicated by LED notification on inside escutcheon.
    2. Redundant actuation of privacy button does not deactivate privacy mode.
- 7) Emergency override access capability by mechanical key cylinder retraction of lock latch bolt without electronic activation necessary.
- 8) Power Source: PoE Class 2; Max 7 W.
- a) PoE Endspan/Midspan, electrical hard wiring, grounding, connections, mounting boxes, and structured cabling framework are required for complete system functionality (by others).
  - b) Network Cabling (by others) Requirements: Meet or exceed ANSI/TIA/EIA- 568-C; CAT5e or higher as set forth by AHJ.
  - c) Bonding and Grounding Requirements: Meet or exceed TIA-607-B to ensure proper operation; Connect locking device ground cable to building electrical earth ground.
  - d) Network Surface Mount Box: Meet or exceed ANSI/TIA/E!B-568-B; CAT5e or higher (RJ45).
    - I. Specified Manufacturer: Sargent 10 Line PoE Series with Bluetooth
    2. Approved Substitutes: NONE

## 2. PoE EXIT DEVICES

- a. Power-over-Ethernet (PoE) Access Control Rim Exit Devices.
  - 1) BHMA certified panic and exit device hardware conforming to ANSI 156.3, Grade 1 standard and ANSI A117.1 accessibility guidelines. Electronic motorized locking control of lever handle (solenoids not acceptable) contained completely within the body of the outside trim control. U.L. listed and labeled for either panic or "Fire Exit Hardware" for use on up to 3 hour fire rated openings.
  - 2) Power-over-Ethernet intelligent access control locking devices interface using standard IEEE 802.3af Ethernet for data and power communication directly from the locking unit back to a host server over an existing or newly installed TCP/IP network facilitating centralized control via a Software Development Kit (SOK) to an online electronic access control system without the need for additional interfaces or , components (excluding PoE Endspan and Midspan devices).
    - a) Provide access control products with non-volatile memory.

- 3) Fully-encrypted AES-128 (IEEE 802.3af) communication between IP Enabled lock and electronic access control system platform via SOK. Programmable time zone periods, blocked holidays, automatic unlock with or without first entry, minimum of 2,400 user codes and the ability to audit the last 10,000 transactions (event type, date, time, user ID and name). Distributed intelligence allows stand alone functional operation of lock in absence of network communication or slowdown allowing for system operational redundancy.
- 4) Integrated reader supports High Coercivity (HiCo) magnetic swipe credentials, HID® 125 kHz proximity credentials or ISO 14443 A/B and ISO 15693 13.56 MHz contactless credentials: HID® iCLASS / iCLASS SE (full authentication, all formats), MIFARE Classic and DESFire EV1 (full authentication, all formats); NFC (Near Field Communications) and HID® SIO-Enabled™.
  - a) Valid/ Invalid credential presentation viewable by means of LED indicators on outside escutcheon.
  - b) Dual factor keypad authentication function optional.
- 5) Environmental Conditions: Conformally coated weather resistant electronic controller shall meet the following minimum requirements:
  - a) Operating temperature: -31 to 150 degrees F (-35 to 65 degrees C)
  - b) Operating humidity: 5% to 95% relative humidity non-condensing
  - c) Weatherized design suitable to withstand harsh environments with a certified rating of IP55
- 6) Configuration: Programming of time zone periods, blocked holidays, automatic unlock with or without first entry, and listing 10,000 event transaction history (consisting of event type, date, time, user ID and name is required).
  - a) Provide network and lock configuration CD tool kit for initial lock set-up and programming via USB connection.
- 7) Monitoring: Software accessible monitoring (via SOK) of inside push rail (Request-to-Exit), integral door position switch (DPS) integral to the lock (door open/closed status), forced door, unknown card, door held open, battery and tamper.
  - a) Standard privacy function initiated from push button on inside escutcheon and cancelled upon activation of valid Request-To-Exit (REX) or user defined credentials.
    1. Activation of privacy function is indicated by LED notification on inside escutcheon.
    2. Redundant actuation of privacy button does not deactivate privacy mode.

- b) Emergency override access capability by mechanical key cylinder retraction of lock latch bolt without electronic activation necessary.
- 8) Power Source: PoE Class 2; Max 7 W.
- a) PoE Endspan/Midspan, electrical hard wiring, grounding, connections, mounting boxes, and structured cabling framework are required for complete system functionality (by others).
  - b) Network Cabling (by others) Requirements: Meet or exceed ANSI/TIA/EIA- 568-C; CAT5e or higher as set forth by AHJ.
  - c) Bonding and Grounding Requirements: Meet or exceed TIA-607-B to ensure proper operation; Connect locking device ground cable to building electrical earth ground.
  - d) Network Surface Mount Box: Meet or exceed ANSI/TIA/EIB-568-B; CAT5e or higher (RJ45).
    - 1. Specified Manufacturer: Sargent 80 PoE Series with Bluetooth
    - 2. Approved Substitutes: NONE

#### 2.4 CABLES AND WIRING

- A. Comply with Division 27 Section "Conductors and Cables for Electronic Safety and Security."
- B. Data Line Supervision: System to include alarm initiation capability in response to opening, closing, shorting, or grounding of data transmission lines.
- C. Install appropriate number of conductor pairs, in the wire gage (AWG) recommended by manufacturer, corresponding to the electronic locking functions specified, amperage drawn and distances covered between the power supplies, power transfer devices, electrified hardware and access control equipment.

#### 2.5 ACCESS CONTROL HARDWARE FINISHES

- A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Where specified hardware shall have an antimicrobial coating which permanently suppresses the growth of bacteria, algae, fungus, mold and mildew applied. The finish shall control the spread and growth of bacteria, mold and mildew and shall be FDA listed for use in medical and food preparation equipment.

## PART 3 - EXECUTLON

### 3.1 EXAMINATION

- A. Contractor shall ensure that the building is secured and free from weather elements prior to installing access control door hardware. Examine hardware before installation to ensure it is free " of defects.(
- B. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance of the installed access control system.
- C. Examine roughing-in for electrical source power to verify actual locations of wiring connections before electrified and integrated access control door hardware installation.
- D. Examine roughing-in for LAN and control cable conduit systems to PCs, controllers, card readers, and other cable-connected devices to verify actual locations of conduit and back boxes before device installation.
- E. Notify architect of any discrepancies or conflicts between the specifications, drawings and scheduled access controlled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### 3.2 PREPARATION

- A. Doors and frames at scheduled access controlled openings to be properly prepared to receive specified electrified and access control hardware connections without additional in-field modifications.

### 3.3 INSTALLATION

- A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with the governing regulations.
  - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (OHL)
  - 2. NWWDA Industry Standard I.S.I .7, "Hardware Locations for Wood Flush Doors."
- B. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.



- D. Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.
- E. Install each item of electrified door hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
- F. Mounting Heights: Mount integrated access control door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Wood Doors: OHi WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - 3. Where indicated to comply with accessibility requirements, comply with ANS[ A117.1 "Accessibility Guidelines for Buildings and Facilities."
- G. Boxed Power Supplies: Verify locations.
  - 1. Configuration: Provide the least number of power supplies required to adequately serve doors with access control equipment.
- H. Final connect the system control switches (integrated card key locking hardware, remote readers, keypads, display terminals, biometrics), and monitoring, and signaling equipment to the related Controller devices at each opening to properly operate the electrified door and access control hardware according to system operational narratives.
  - 1. System Application Software: Install, and test application(s) software and databases for the complete and proper operation of systems involved. Assign software license(s) to Owner.

### 3.4 FIELD QUALITY CONTROL

- A. The Contractor shall comply with AJA A201 1997 section 3.3.1 which reads as follows: "The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the contract Documents give other specific instructions concerning these matters."
- B. Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective products. A letter of compliance, indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.
- C. The hardware supplier shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.

- D. The manufacturer's representative shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.
- E. Commissioning and Testing Schedule: Prior to final acceptance of the access control system installation, the following testing and documentation to be performed and provided to the Owner.
  - 1. Inspection: Verify that units and controls are properly installed, connected, and labeled and • that interconnecting wires and terminals are identified. (
  - 2. Pre-testing: Program and adjust the system and pretest all components, wiring, and functions to verify they conform to specified requirements. Provide testing reports indicating devices tested, pass/fail status, and actions taken to resolve problem(s) on failed tests.
  - 3. Acceptance Test Schedule: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
  - 4. Provide "as designed" drawings showing each device and wiring connection and electronic enclosure legends showing cabling in and out.
  - 5. Provide a complete set of operating instructions for access control hardware devices and a complete software user manual. The documentation includes module reference guides for each electronic enclosure.

### 3.5 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
- B. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore to proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes and usage of any electronic devices.

### 3.6 PROTECTION

- A. Contractor shall protect all hardware, as it is stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

### 3.7 HARDWARE SCHEDULE

- A. The following schedule is furnished for whatever assistance it may afford the Contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware heading, provide door or item with hardware same as required for similar purposes.

Hardware supplier is responsible for handing and sizing all products as listed in the hardware heading. Quantities listed are for each pair of doors, or for each single door.

- B. Refer to Section 080671, Door Hardware Schedule, for hardware sets.

END OF SECTION 281300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
  - 1. Fire-alarm control unit.
  - 2. Manual fire-alarm boxes with covers.
  - 3. System smoke detectors.
  - 4. Non-addressable heat detectors.
  - 5. Notification appliances.
  - 6. Addressable interface device.

1.3 DEFINITIONS

- A. LED: Light-emitting diode.
- B. NICET: National Institute for Certification in Engineering Technologies.

1.4 SYSTEM DESCRIPTION

- A. Noncoded addressable system, with automatic sensitivity control of certain smoke detectors and multiplexed signal transmission, dedicated to fire-alarm service only. Fire alarm system must be FM approved.
- B. All fire alarm designs and fire alarm system wiring shall be pre-approved by TPC Associates, CCSU Fire Alarm Company.
- C. All changes to the fire alarm design and fire alarm system wire shall be pre-approved by TPC Associates, CCSU Fire Alarm Company.

1.5 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.6 SUBMITTALS

A. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
  - a. Trained and certified by manufacturer in fire-alarm system design.
  - b. NICET-certified fire-alarm technician, Level III and/or Level IV minimum.
  - c. Licensed or certified by authorities having jurisdiction.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
2. Include voltage drop calculations for notification appliance circuits.
3. Include battery-size calculations.
4. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
5. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
6. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
7. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

D. Delegated-Design Submittal: For smoke and heat detectors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Drawings showing the location of each smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the detector.
2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72.

E. Qualification Data: For qualified Installer.

F. Seismic Qualification Certificates: For fire-alarm control unit, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

G. Field quality-control reports.

H. Operation and Maintenance Data: For fire-alarm systems and components to include in operation and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
3. Record copy of site-specific software.
4. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:
  - a. Frequency of testing of installed components.
  - b. Frequency of inspection of installed components.
  - c. Requirements and recommendations related to results of maintenance.
  - d. Manufacturer's user training manuals.
5. Manufacturer's required maintenance related to system warranty requirements.
6. Abbreviated operating instructions for mounting at fire-alarm control unit.
7. Copy of NFPA 25.

I. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.
- C. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- E. NFPA Certification: Obtain certification according to NFPA 72

#### 1.8 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- C. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
  - 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

#### 1.9 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
  - 2. Smoke Detectors and Heat Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than 1 unit of each type.
  - 3. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but no fewer than 1 unit of each type.
  - 4. Keys and Tools: One extra set for access to locked and tamper-proofed components.
  - 5. Audible and Visual Notification Appliances: One of each type installed.
  - 6. Fuses: Two of each type installed in the system.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Fire alarm equipment shall match University standard specifications from Edwards (EST). Control panel shall be Edwards EST4. All fire alarm devices shall be manufactured for use with EST (Edwards) and approved for use on an EST4 Fire Alarm system.

#### 2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
  - 1. Manual stations.
  - 2. Heat detectors.

3. Smoke detectors.
4. Verified automatic alarm operation of smoke detectors.
5. Heat detectors in elevator shaft and pit.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm at fire-alarm control unit.
3. Transmit an alarm signal to the Hospital system.
4. Recall elevators to primary or alternate recall floors.
5. Record events in the system memory.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Low-air-pressure switch of a dry-pipe sprinkler system.
3. Elevator shunt-trip supervision.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at fire-alarm control unit.
4. Ground or a single break in fire-alarm control unit internal circuits.
5. Abnormal ac voltage at fire-alarm control unit.
6. Break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at fire-alarm control unit.
9. Low-air-pressure switch operation on a dry-pipe or preaction sprinkler system.

E. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit.

## 2.3 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by an NRTL. Unit shall be capable of serving all initiating and notification appliances connected with 20% spare capacity.
  - a. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
  - b. Include a real-time clock for time annotation of events on the event recorder and printer.
2. Addressable initiation devices that communicate device identity and status.



- a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
  - b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.
3. Addressable control circuits for operation of mechanical equipment.
- B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu. All system programming shall be done by TPC Associates, CCSU Fire Alarm Company.
  1. Annunciator and Display: Liquid-crystal type, 2 line(s) of 40 characters, minimum.
  2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.
- C. Circuits:
  1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.
    - a. Initiating Device Circuits: Style B.
    - b. Notification Appliance Circuits: Style Y.
    - c. Signaling Line Circuits: Style 3.
    - d. Install no more than 50 addressable devices on each signaling line circuit.
- D. Smoke-Alarm Verification:
  1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
  2. Activate an NRTL-listed and -approved "alarm-verification" sequence at fire-alarm control unit and detector.
  3. Sound general alarm if the alarm is verified.
  4. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.
- E. Notification Appliance Circuit: Operation shall sound with an initial alert tone, followed by a pre-recorded emergency voice message of approximately 15 seconds, followed by a repeating alarm "whoop" tone.
- F. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke barrier walls shall be connected to fire-alarm system.
- G. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory and print out the final adjusted values on system printer.

- H. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.
- I. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals and supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.
  - 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- J. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
  - 1. Batteries: Vented, wet-cell pocket, plate nickel cadmium.

#### 2.4 MANUAL FIRE-ALARM BOXES

- A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
  - 1. Single-action mechanism, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
  - 2. Equipment shall be rated for operation at 0°F. If this rating cannot be achieved then standard, non-addressable stations shall be utilized and each shall be wired to an addressable module installed in a heated location or heated enclosure.
  - 3. Station Reset: Key operated switch.
  - 4. Furnish all pull stations with outdoor rated non-alarmed Lexan cover.

#### 2.5 SYSTEM SMOKE DETECTORS

- A. Photoelectric Smoke Detectors:
  - 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
  - 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    - a. Primary status.
    - b. Device type.
    - c. Present average value.
    - d. Present sensitivity selected.
    - e. Sensor range (normal, dirty, etc.).

## 2.6 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
  - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
  - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F.
  - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
  - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

## 2.7 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Connected to notification appliance signal circuits, zoned as indicated, equipped for mounting as indicated and with screw terminals for system connections. All notification appliances shall be rated for outdoor installations and shall be furnished with appropriate backbox for this rating.
  - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.
- B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.
- C. Visible Notification Appliances: Xenon strobe lights comply with UL 1971 and ADA, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch high letters on the lens.
  - 1. Rated Light Output: 15/30/75/110 cd, selectable in the field.
  - 2. Mounting: Wall mounted unless otherwise indicated.
  - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
  - 4. Flashing shall be in a temporal pattern, synchronized with other units.
  - 5. Strobe Leads: Factory connected to screw terminals.
  - 6. Mounting Faceplate: Factory finished, red.

## 2.8 ADDRESSABLE INTERFACE DEVICE

- A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- B. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall, to circuit-breaker shunt trip for power shutdown and other functions as required.

## 2.9 FIBER CABLING

- A. All fiber used for the fire alarm system shall be pre-approved for use by CCSU I.T. and TPC Associates, CCSU Fire Alarm Company.
- B. Any change to the fiber being used for the fire alarm system shall be pre-approved for use by CCSU I.T. and TPC Associates, CCSU Fire Alarm Company.

## PART 3 - EXECUTION

### 3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72 for installation of fire-alarm equipment.
- B. Equipment Mounting: Install fire-alarm control unit on wall with tops of cabinets not more than 72 inches above the finished floor. Install control unit in electrical room unless otherwise coordinated with Owner.
- C. Smoke- or Heat-Detector Spacing:
  - 1. Smooth ceiling spacing shall not exceed 30 feet.
  - 2. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A in NFPA 72.
  - 3. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.
  - 4. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture.
- D. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.
- E. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.
- F. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Take caution as the EST speaker strobes sit on the box different than other devices.

- G. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Take caution as the EST speaker strobes sit on the box different than other devices.
- H. Annunciator: Install with top of panel not more than 72 inches above the finished floor.
- I. All roof (level four) devices shall be installed per code at a maximum height of 8 feet above finished deck.

### 3.2 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Division 08 Section "Door Hardware." Connect hardware and devices to fire-alarm system.
  - 1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
  - 1. Alarm-initiating connection to elevator recall system and components.
  - 2. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
  - 3. Supervisory connections at valve supervisory switches.
  - 4. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
  - 5. Supervisory connections at elevator shunt trip breaker.
- C. All fire alarm system wire and cable shall be installed in a dedicated conduit system.
- D. No splices of fire alarm cabling are allowed below grade.
- E. Provide an LFMC sweep into the bottom of all Speaker/Strobes and Pull Stations as indicated on the drawings.

### 3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

### 3.4 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.5 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
  - 1. Visual Inspection: Conduct visual inspection prior to testing.
    - a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
    - b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
  - 2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
  - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
  - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
  - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
  - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.
- J. The Fire Alarm control panel is required to be tied into the live CCSU Campus Fiber loop. The final fire alarm fiber tie-in shall be the responsibility of the Electrical GC for this project and shall be done with the approval/supervision of CCSU Fire and TPC Associates, CCSU Fire Alarm Company and Mercury Cable. The final tie-in shall only be made once the new project/garage FACP is clear of any active troubles or alarms.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system. Training shall be eight (8) hours. Training shall be recorded and delivered to Owner at completion.

END OF SECTION 283111

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**SECTION 31 11 00 CLEARING AND GRUBBING**

**PART 1 - GENERAL**

1.1 GENERAL REQUIREMENTS.

A. The following shall apply to work in this section:

1. The applicable provisions of the Connecticut Edition of the International Building Code, latest edition or as enforced by the local agency.

1.2 SCOPE OF WORK

- A. Clearing Site of debris, grass, trees, and other plant life in preparation for parking and storm drainage improvements.
- B. Protection of existing structures, trees, or vegetation indicated in contract documents to remain.
- C. Removal of existing sidewalks, drives, curbs, etc.
- D. Removal of asphalt pavement where indicated on contract documents and as specified herein.
- E. Stripping topsoil, if necessary, from areas that are to be incorporated into limits of project.
- F. Disposal of cleared, grubbed, and stripped materials in accordance with all applicable codes and ordinances.

1.3 RELATED SECTIONS AND DOCUMENTS

- A. Section 31 25 00 – Soil Erosion and Sediment Control

1.4 REFERENCE STANDARDS

- A. The Connecticut Department of Energy & Environmental Protection's (CTDEEP) Guidelines for Soil Erosion and Sediment Control, latest edition.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Construct temporary erosion control systems to protect adjacent properties and water resources from erosion and sedimentation.
- B. Contractor shall be totally responsible for conducting soil erosion and sediment control and the storm water management practices in accordance with all applicable permits and for enforcement action taken or imposed by federal or state agencies, including cost of fines, construction delays, and remedial actions resulting from contractor's failure to comply with all provisions of the applicable permits.

1.6 PROJECT CONDITIONS

- A. Contractor to provide a thorough inspection of the site prior to bidding and accept the site as is.
- B. Variations to conditions or discrepancy in actual or described as proposed conditions as they apply to site preparation operations are to be brought to the attention of the Owner prior to commencement of sitework.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. Off-site materials shall be transported to project using well maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.

**PART 3 - EXECUTION**

3.1 PREPARATION

- A. Verify existing plant life that is to remain and any clearing limits are clearly tagged, identified, and fenced in such manner as to insure their safety throughout construction operations.



3.2 PROTECTION

- A. Locate and identify existing utilities that are to remain and protect from damage.
- B. Protect trees, plant growth, and features not designated for removal.
- C. Conduct operations with minimum interference to public or private accesses and facilities. Maintain ingress and egress at all times and clean or sweep roadways daily as required by the governing authority. Dust control shall be provided with sprinkling systems or equipment provided by contractor.
- D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, by same at contractor's cost.
- E. Provide traffic control as required, in accordance with the U.S. Department of Transportation's "Manual on Uniform Traffic Control Devices", Connecticut Department of Transportation and local requirements.

3.3 CLEARING, GRUBBING AND STRIPPING

- A. The Contractor shall clear areas required for execution of work.
- B. Unless otherwise indicated on Construction Drawings, the contractor shall remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with installation of new construction. Removal includes digging out stumps and roots. Depressions caused by clearing and grubbing operations are to be filled to subgrade elevation to avoid collecting water to form ponds.
- C. Remove grass, trees, plant life, stumps, and other construction debris from site to dump Site that is suitable for handling such material according to state laws and regulations.
- D. The Contractor shall strip all asphalt from any areas to receive new fill. Removed asphalt can be milled by the Contractor and asphalt millings can be reused as subbase material beneath new pavements. Asphalt to be used as recycled material shall be milled to form a well-graded material having a maximum particle size of 2 inches. The Contractor shall provide dust control measures during any milling process. Excess asphalt materials shall be properly disposed of in accordance with all applicable codes and ordinances.

**END OF SECTION 31 11 00**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Wherever reference is made to the DOT Specifications, it shall mean the Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 817, most recent edition, as modified by Supplemental Specifications issued by the Connecticut Department of Transportation.
- C. Alternates: Refer to Division 01 Section "Alternates" for description of Work of this Section affected by alternates.

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Backfilling excavations with specified materials in compacted lifts.
  - 2. Preparing subgrades for slabs-on-grade, stair, ramps, pads, walks, pavements, lawns, and plantings.
  - 3. Excavating and backfilling for buildings and structures.
  - 4. Subbase and base course for concrete walks and pavements.
  - 5. Subsurface drainage backfill for walls, trenches, pavements, and athletic facilities.
  - 6. Excavating and backfilling trenches within building lines.
  - 7. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.
- B. Related Sections include the following:
  - 1. Division 01 Section "Unit Prices" for Work covered by unit prices and procedures for measurement and payment
  - 2. Section 00 31 32 - Geotechnical Data
  - 3. Section 31 63 17 – Aggregate Columns for Subgrade Stiffening

1.3 DEFINITIONS

- A. Backfill: Suitable soil materials used to raise existing grades.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill an excavated area to final grade.
- B. Base Course: Layer placed between the subbase course and asphalt paving.

- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow: Suitable soil imported from off-site for use as fill or backfill as approved by geotechnical engineers.
- E. Excavation: Removal of material encountered above subgrade elevations.
  - 1. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without advice from by Owner's Geotechnical Engineer. Unauthorized excavation, as well as remedial work recommended by Owner's Geotechnical Engineer, shall be without additional compensation.
- F. Fill: Suitable soil materials, as determined by the Owner's Geotechnical Engineer, used to raise existing grades.
- G. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
  - 1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator equal to Caterpillar Model No. 215D-LC; equipped with a 42-inch- wide, short-tip-radius rock bucket; rated at not less than 120-hp flywheel power with bucket-curling force of not less than 25,000 lbf and stick-crowd force of not less than 18,000 lbf; measured according to SAE J-1179.
  - 2. Bulk or Open Excavation: Late-model, track-type tractor, equal to Caterpillar Model No. D-8N, rated at not less than 285-hp flywheel and equipped with a single-shank hydraulic ripper, capable of exerting not less than 45,000-lbf breakout force; measured according to SAE J-732.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
- J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, or topsoil materials.
- K. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as under-ground services within buildings.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Each type of plastic warning tape.
  - 2. Geotextile Separation fabric.
  - 3. Geogrid.
- B. Samples: For the following:
  - 1. 30-lb samples, sealed in airtight containers, of each proposed soil material from on-site or borrow sources.

2. 12-by-12-inch sample of geotextile separation fabric.
  3. 12-by-12 inch sample of geogrid.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill. Fill and backfill materials specified herein (except crushed stone) shall be gradation tested using a wet sieve method (ASTM D422 (gradation) with ASTM D1140 (wet wash) or approved equal). Crushed stone may be gradation tested using a dry sieve method (ASTM C136 or approved equal).
  2. Certification that geotextiles and geogrid meet specification requirements.
  3. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.
  4. Documentation for each borrow material proposed for use that demonstrates that the material meets applicable CT DEEP Remediation Standard Regulation criteria for soil, either through knowledge of the soil material or analytical testing of known or suspected contaminants, and is free of contaminants.
- D. Temporary Excavation Support
1. Proposed method of temporary excavation support.
  2. Design drawings showing the locations of excavation support and calculations. Excavation design shall be in accordance with all OSHA and other applicable regulatory agency requirements, and sealed by a registered Professional Engineer.
  3. Certification of acceptable quality materials.

#### 1.5 QUALITY ASSURANCE

- A. Testing Agency: Independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock testing.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill. All fill and backfill materials specified herein except crushed stone shall be gradation tested using a wet sieve method (ASTM D422 (gradation) with ASTM D1140 (wet wash) or approved equal). Crushed stone may be gradation tested using a dry sieve method (ASTM C136 or approved equal).
  2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

#### 1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by others unless permitted in writing by

Owner and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Owner's written permission.
  3. Contact utility-locator service for area where Project is located before excavating.
  4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- B. Subsurface investigation data are available in the geotechnical report entitled, "Geotechnical Report, Willard Diloreto Parking Garage, Central Connecticut State University, New Britain, Connecticut", dated January 18, 2019 prepared by Freeman Companies, LLC. The Geotechnical Engineering Report is available at the Owner's office, and is for informational purposes only. The Contractor shall anticipate variations from the conditions disclosed by the borings in planning and estimating the work.

## PART 2 – PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials consisting of suitable soil when sufficient suitable soils are not available from excavations.
- B. Suitable Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, reclaimed or recycled materials (i.e., asphalt, concrete, glass, etc.), and other deleterious matter.
- C. Unsuitable Soils: ASTM D 2487 soil classification groups GC, SC, MH, CH, OL, OH, and PT, or a combination of these group symbols, or soil containing reclaimed or recycled materials (i.e., asphalt, concrete, glass, etc.), or other deleterious matter.
- D. Unsuitable soils also include suitable soils not maintained by the General Contractor within 2 percent of optimum moisture content at time of compaction.
- E. Backfill and Fill: Suitable soil that meets specification requirements.
- F. Common Fill: Suitable soil that can be placed and compacted.
- G. Structural Fill: Suitable soil consisting of naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, and free of all re-claimed aggregate; CTDOT Form 817, Section 2.14, Compacted Granular Fill, and meeting the material requirements of M.02.01, 2 – Bank or Crushed Gravel, and conforming to M.02.06, Grading A.
- H. Crushed Stone: Suitable soil consisting of washed, narrowly graded mixture of crushed stone, or crushed gravel; CTDOT Form 817, M.01.01, Grading No 8 (3/8-inch to No. 8).
- I. Geotextile Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties and referenced standard test methods:

1. Grab Tensile Strength: 250 lbf; ASTM D 4632.
  2. Tear Strength: 100 lbf; ASTM D 4533.
  3. Puncture Resistance: 700 lbf; ASTM D 6241.
  4. Water Flow Rate: 75 gpm per sq. ft.; ASTM D 4491.
  5. Apparent Opening Size: No. 100; ASTM D 4751.
- J. Biaxial Geogrid: Geosynthetic specifically manufactured for use as a subgrade reinforcement. Tensar BX1100 or approved equal shall be used. The following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
1. Aperture Dimensions: 1.0 in. (MD) 1.3 (XMD)
  2. Tensile Strength at 2% Strain: 280 lbs./ft (MD) 450 lbs./ft. (XMD) ASTM D 6637-10 Method A
  3. Tensile Strength at 5% Strain: 580 lbs./ft (MD) 920 lbs./ft. (XMD) ASTM D 6637-10 Method A
  4. Ultimate Tensile Strength: 850 lbs./ft. (MD) 1,300 lbs./ft. (XMD) ASTM D 6637-10 Method A
  5. Junction Efficiency: 93 percent ASTM D 7737-11
  6. Resistance to Long Term Degradation: 100% EPA 9090
  7. Resistance to UV Degradation: 100% ASTM D 4355-5
- K. ACCESSORIES
1. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by met-al detector when tape is buried up to 30 inches deep; colored as follows:
    - a. Red: Electric.
    - b. Yellow: Gas, oil, steam, and dangerous materials.
    - c. Orange: Telephone and other communications.
    - d. Blue: Water systems.
    - e. Green: Sewer systems
  2. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
  3. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a mini-mum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

- L. Base Course: Suitable soil conforming to Processed Aggregate Base, CTDOT Form 817 Section 3.04 and material requirements of M.05.01.
- M. Subbase Course: Suitable soil conforming to Subbase, CTDOT Form 817 Section 2.12, and material requirements of M.02.02 and M.02.06 Grading A

### PART 3 – EXECUTION

#### 3.1 PREPARATION

- A. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- B. Soils at the site are sensitive to disturbance and can easily become muddy and unstable when disturbed by traffic from heavy construction equipment or other construction operations. The Contractor shall take all measures necessary to maintain stable site conditions. Placement of crushed stone over geotextile fabric, aggregate over geogrids, and other measures may be required to maintain stability.
- C. The Contractor shall be responsible for designing, installing, and removing temporary access roads for heavy construction vehicles and support pads for heavy equipment loads, while at the same time maintaining subgrades in a stable condition. The Contractor shall be responsible for placement of multiple layers of crushed stone over geotextile fabric, aggregate over geogrids, or other appropriate measures, as needed for stability.
- D. Proofrolling subgrade areas shall not be conducted during wet weather to avoid the potential for creating more disturbance than improvement. If proofrolling must be conducted during wet weather, the materials disturbed by proofrolling must be removed and replaced.
- E. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- F. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary. Remove and replace subgrade material and foundation soils that have frozen.
- G. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

#### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
  - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

#### 3.3 EXCAVATION, GENERAL

- A. Classified Excavation: Excavation to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by the Owner's geotechnical engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents.
1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures; utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

### 3.4 EXCAVATION OF UNSUITABLE MATERIALS

- A. Dispose of unsuitable soil, and rock, off site properly and replace with approved fill material as required to bring the site to final elevations. Contractor shall excavate all material deemed "unsuitable" by the Owner's geotechnical engineer. In the case of any question or inconsistencies, the Owner's geotechnical engineer's determination of unsuitable soils shall be final.
- B. All excavation is to be observed and monitored by the Owner's Testing Agency. Any excavation performed by Contractor, which is not monitored by the Owner's Testing Agency shall be at the Contractor's expense.
- C. During construction the Contractor shall submit quantities of proposed soils removed to the Owner or Architect for verification. The total cost for bulk removal and replacement shall be based on the total verified quantities of materials removed, paid for at the unit price identified in the Form of Lump Sum Proposal. This amount, so calculated, shall replace the amount identified in the quantity allowances and the Contractor's fee shall neither increase nor decrease on account of the adjustment.
- D. The Contractor agrees that this adjustment for the actual quantities will compensate for all cost of the actual quantities of unsuitable materials (and the importation of replacement fill) and agrees that the Contractor will in no case seek additional monetary compensation beyond the adjustment described in the Quantity Allowances, regardless of the actual amount of unsuitable material or the amount of variance between the estimated and actual quantities.

### 3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
- B. Subgrades below new footings will be stiffened by installing Aggregate Columns as indicated in Section 31 63 17, Aggregate Columns For Subgrade Stiffening. A 12-inch thick layer of Crushed Stone over Separation Fabric shall be placed over the subgrade after installation of aggregate columns is complete.
- C. The Contractor shall be responsible for protection of the subgrade in areas where the aggregate columns will be installed. A working pad may be required over the subgrade to support construction equipment during installation and before foundation construction. Multiple layers of geogrids, geotextiles, and graded aggregate will likely be required. The Contractor shall be responsible for the design, installation, and maintenance of an effective working pad if needed.
- D. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or mi-nus 1 inch. Do not disturb bottom of excavations intended for bearing surface.



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### 3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

### 3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths, in accordance with OSHA guidelines, to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
  - 1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
  - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. See Plans for trenching details.
  - 3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

### 3.8 APPROVAL OF SUBGRADE

- A. Notify Owner's geotechnical engineer when excavations have reached required subgrade.
- B. Soil subgrades are susceptible to disturbance and loss of strength due to construction equipment operating over the subgrade or other disturbance when the subgrade is wet or moist. All loose, saturated or disturbed materials that are unsuitable and shall be removed and replaced with compacted Structural Fill.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner's geotechnical engineer.

### 3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
  - 1. Fill unauthorized excavations under other construction or utility pipe as directed by the Owner's geotechnical engineer.

### 3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and suitable excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust, and to protect soils

from becoming excessively wet due to rain-fall or infiltration from other sources.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, dampproofing, water-proofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

### 3.12 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.
- C. Provide 4-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.
- D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- E. Coordinate backfilling with utilities testing.
- F. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- G. Place and compact backfill to final subgrade.
- H. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.13 FILL

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- A. Preparation: Remove vegetation, topsoil, debris, unsuitable soil materials, obstructions, and deleterious materials from ground surface before placing fills.
  - B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
  - C. Place and compact fill material in layers to required elevations as follows:
    - 1. Under grass and planted areas, use Common Fill.
    - 2. Under walks and pavements, use Common Fill, Base, and Subbase.
    - 3. Under steps and ramps, use Common Fill and Structural Fill (in landscaped areas), or Structural Fill (below building structures).
    - 4. Under footings and foundations, use Crushed Stone, Separation Fabric, and Structural Fill.
    - 5. Around perforated or slotted drainage pipes, use Crushed Stone around the drainage pipe and Separation Fabric around the Crushed Stone.
    - 6. Above drainage pipes, use Common Fill (in landscaped areas), Base and Subbase (in pavement areas), or Structural Fill (in building areas).
  - D. Place fill and other materials as indicated on the drawings.

### 3.14 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air-dry, otherwise suitable soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.15 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557.
  - 1. Under structures, building slabs, steps and pavements, the compaction shall be a minimum of 95 percent of the maximum dry density.
  - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or

fill material to a minimum of 90 percent of the maximum dry density.

3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material to a minimum of 90 percent of the maximum dry density.

4. In sloped areas, step or bench the existing ground surface prior to placement of fill.

- D. Existing on-site soils may be reused as Common Fill. However, the on-site soils may have a high fines content, be difficult to place and compact when wet, and may need to be dried or amended with another material to achieve compaction. The Contractor is advised that achieving compaction can be difficult and time consuming, particularly during periods of cold or wet weather. The Contractor shall protect stockpiled materials from rainfall, and shall protect placed and compacted fill from wet weather and disturbance from construction operations.
- E. Fill placed at the edge of a slope shall be placed beyond the final slope limits and then cut back, to achieve the required compaction at the edge of the slope.

### 3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
  2. Cut out soft spots, fill low spots, and trim high spots to comply with required sur-face tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 1 inch.
  2. Walks: Plus or minus 1/2 inch.
  3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

### 3.17 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course on prepared subgrade and as follows:
1. Place base course material over subbase.
  2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
  3. Shape subbase and base to required crown elevations and cross-slope grades.
  4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
  5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

- B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 60 inches wide, of Common Fill and compact each layer of Common Fill, subbase, and base layer to not less than 90 percent of maximum dry unit weight according to ASTM D 1557.

### 3.18 FIELD QUALITY CONTROL

- A. Owner's Geotechnical Engineer or Testing Agency: Owner will engage a qualified geotechnical engineer or Testing Agency to perform laboratory and field quality control testing.
- B. Allow Owner's geotechnical engineer or testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Owner's geotechnical engineer or testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - 1. Paved and Structure Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 5000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
  - 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.
- D. When Owner's geotechnical engineer or testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

### 3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to sub-sequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Architect; re-shape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
- D. Protect areas with slopes exceeding 1 vertical : 2 horizontal with erosion-control fiber mesh and with erosion-control blankets installed and stapled according to manufacturer's written instructions.
- E. Protect areas with slopes not exceeding 1 vertical : 2 horizontal by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into topsoil with suitable mechanical equipment.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus suitable soil and waste material, including unsuitable soil, trash, and debris, and legally dispose of it off Owner's property.
  1. Remove waste material, including unsuitable soil, trash, and debris, and legally dis-pose of it off Owner's property.

END OF SECTION

**SECTION 31 23 16 EXCAVATION, BACKFILL & SUBGRADE PREPARATION FOR PAVEMENT**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK**

- A. Excavation and backfilling to line, grade and configuration as shown in the Contract Documents and as described in these specifications for proposed asphaltic concrete, porous asphaltic concrete and Portland cement concrete pavement
- B. Removal of unsuitable material beneath proposed paved areas.
- C. Compacting fill materials in acceptable manner as specified herein.

**1.2 RELATED SECTIONS AND DOCUMENTS**

- A. Section 31 25 00 – Soil Erosion and Sediment Control
- B. Section 32 12 16 – Asphaltic Concrete Paving
- C. Section 32 13 13 – Portland Cement Concrete Paving
- D. Section 32 16 13 – Curbs and Sidewalks
- E. City of New Britain requirements
- F. Contract Drawings and Documents

**G. REFERENCE STANDARDS**

- H. American Society for Testing and Materials (ASTM) - latest edition
  - 1. D 422 Method for Particle Size Analysis of Soils
  - 2. D 1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)
  - 3. D 2216 Laboratory Determination of Moisture content of Soil
  - 4. D 2487 Classification of Soils for Engineering Purposes
  - 5. D 2922 Tests for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)
  - 6. D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
  - 7. D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils
- I. American Association of State Highway and Transportation Officials (AASHTO) - latest edition
  - 1. T 88 Mechanical Analysis of Soils
- J. All applicable OSHA Regulations.

**1.3 QUALITY ASSURANCE**

- A. An Engineer, familiar with the Contract Documents, selected and paid by the Owner (herein referenced to as "Owner's Engineer"), may be retained to perform construction testing on filling operations and subgrade preparation as described herein. This inspection will not relieve the Contractor from his responsibility to complete the work in accordance with the plans and specifications.

**1.4 SUBMITTALS**

- A. Shop drawings or details pertaining to excavating and filling for structures are not required unless otherwise shown on Contract Document or if procedures contrary to the Contract Documents are proposed.

**PART 2 - PRODUCTS**

**2.1 EQUIPMENT**

- A. Off-site materials shall be transported to project using well maintained and operating vehicles. Once on-site, transporting vehicles shall at no time endanger improvements by rutting, overloading, or pumping.
- B. Excavation is to be performed using capable, well maintained equipment and methods acceptable to the Owner and the Contract Document requirements and schedule.
- C. Compaction shall be performed using a 10-ton static drum weight, vibratory, smooth drum roller or as specified by the engineer.
- D. Smaller compaction equipment, together with thinner lifts may be required at areas of limited access or maneuverability. In such a case, the compaction equipment shall be a double drum walk-behind roller and shall be subject to the Owner's Engineer approval.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Identify lines, elevations, and grades necessary to construct pavements, curb, sidewalk, and roadways as shown on Contract Documents.
- B. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
- C. Locate and identify site utilities that have previously been installed and protect from damage.
- D. Locate and identify existing utilities that are to remain and protect from damage.
- E. Over excavate and properly prepare areas of subgrade that are not capable of supporting proposed systems. These areas shall be stabilized by using aggregate material placed and compacted as specified.

**3.2 EXCAVATION**

- A. Excavate roadways and pavement areas to line and grade as shown on the Contract Documents.
- B. Areas of existing curb islands, sidewalks and existing pavement failure shall be excavated to competent soil to the satisfaction of the Owner's Engineer. Excavation of soft soils will be required in both fill and overlay areas to the satisfaction of the Owner's Engineer.
- C. Perform excavation using capable, well-maintained equipment and methods acceptable to Owner and local governing agencies.
- D. Where existing grades are above proposed subgrade elevation, excavate materials in the pavement areas to the subgrade elevations necessary based on the finished pavement lines and grades as shown in the Contract Documents being careful not to over excavate beyond the elevations needed. Replacement of fill in areas over excavated by the Contractor without approval of the Owner's Engineer shall be replaced as compacted fill in accordance with these Specifications at no additional cost to the Owner.
- E. Excavated on-site soils approved by the Owner's Engineer may be used as fill on-site.
- F. Excavated on-site soils that are unsuitable for fill may be used in landscaped areas if approved by the Owner's Engineer. Otherwise this material shall be legally disposed of off-site at no additional cost to the Owner.
- G. Unsuitable material, such as wood and any other deleterious materials determined to be unsuitable by the Owner's Engineer for use as on-site fill shall be legally disposed of off-site at no additional cost to the Owner.

**3.3 SUBGRADE PREPARATION**



- A. Existing grades below areas of proposed pavement shall be leveled prior to fill placement. The Contractor shall remove existing trees, roots, stumps, organic wetland soils, and top soil in these areas prior to placement of any fill and legally dispose of this material off-site at no additional cost to Owner.
- B. The Contractor shall drain any standing or puddled water in low lying areas.
- C. All existing grades below areas of proposed pavement shall be proofrolled and compacted with a minimum of 6 overlapping passes using the vibratory drum roller specified in part 2.1 of this Section prior to placement of pavement subbase. Existing areas which exhibit "pumping" or "rutting" under the action of the roller shall be removed and replaced with suitable fill material as directed by the Owner's Engineer.
- D. Excavated on-site soils that are unsuitable for pavement subgrade below paved areas may be used in landscaped areas if approved by the Owner's Engineer. Otherwise this material shall be legally disposed of off-site at no additional cost to the Owner.
- E. Unsuitable material, such as wood and any other deleterious materials determined to be unsuitable by the Owner's Engineer for use as on-site fill shall be legally disposed of off-site at no additional cost to the Owner.

**3.4 SUBGRADE FILL PLACEMENT AND COMPACTION**

- A. Fill material shall not be placed in areas of standing water, in areas of frozen or thawing ground, or in areas that have not been approved by the Owner's Engineer.
- B. Fill materials shall not be placed during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until all saturated surficial soils are returned to a satisfactory moisture content as determined by the Owner's Engineer.
- C. Maintain optimum moisture content of fill materials as specified herein to attain required compaction density.
- D. If compaction requirements are not complied with at any time during construction process, remove and re-compact deficient areas until proper compaction is obtained at no additional expense to Owner.
- E. Fill lift surfaces shall be made smooth and free from ruts or indentations at the end of any work day when significant precipitation is forecast to prevent saturation of surficial fill material. Fill surfaces shall be graded to drain and sealed with a smooth drum roller at the completion of each work day.
- F. Subgrade fill in paved areas shall be placed in uniform loose lifts and compacted in accordance with the Specifications.
- G. Wet, saturated material shall be removed and replaced or scarified and air dried as necessary to achieve the field densities specified in this Section. Drying may be assisted by discing, harrowing, or pulverizing until moisture content is reduced.
- H. Prior to paving, the subgrade shall be proofrolled with a minimum of 6 overlapping passes using a 10-ton static drum weight vibratory roller.
- I. Remove areas of finished subgrade found to have insufficient compaction density of depth necessary and replace with suitable compacted fill as approved by the Owner or Owner's Engineer. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

**3.5 MAINTENANCE OF APPROVED SUBGRADE SURFACES**

- A. Finished subgrades shall be verified to ensure proper elevation and conditions for construction above subgrade.
- B. Protect subgrade from excessive wheel loading during construction including concrete trucks, dump trucks, and other construction equipment.
- C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material that has been approved by the Owner's Engineer. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

3.6      **QUALITY CONTROL**

- A.      Compaction tests shall be performed by the contractor as follows for areas of proposed pavement:
  - 1.          In cut areas, not less than one compaction test for every 15,000 square feet.
  - 2.          In fill areas, one test for every 15,000 square feet for each lift.
- B.      Prior to paving, the finished subgrades shall be verified by the Contractor to ensure proper elevation and conditions for construction above subgrade.
- C.      Tolerances of 0.10 feet will be permitted. Any deviation from the design grades shall not result in changes in drainage areas or ponding. The Contractor shall provide engineering and field staking necessary for verification of lines, grades, and elevations.

**END OF SECTION 31 23 16**

**SECTION 31 23 33 TRENCH EXCAVATION AND BACKFILL**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK**

- A. Excavating trenches for the installation of storm drainage, utilities and lighting conduits.
- B. Backfilling trench with bedding material as specified and finish filling trenches with suitable material to proposed subgrade.
- C. Compacting subgrade, bedding, and backfill materials in an acceptable manner.
- D. Compliance with all environmental and health and safety regulations.

**1.2 RELATED SECTIONS AND DOCUMENTS**

- A. Section 31 25 00 – Soil Erosion
- B. Section 31 11 16 – Site Water
- C. Section 33 41 00 – Storm Sewer
- D. Section 33 71 00 – Utilities
- E. Construction Documents and Drawings
- F. Governing Authority Requirements, specifically The City of New Britain, New Britain Water Department, the Water Pollution Control Authority (WPCA), Eversource, and others

**1.3 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM) Latest Edition
  - 1. D 422 Method for Particle Size Analysis
  - 2. D 698 Test of Moisture Density Relations of Soils - Standard Proctor Method
  - 3. D 1557 Test for Moisture-Density Relations of Soils Using 10-lb. (4.5 Kg)
  - 4. Hammer and 18-inch (457 mm) Drop (Modified Proctor)
  - 5. D 2216 Laboratory Determination of Moisture Content of Soil
  - 6. D 2487 Classification of Soils for Engineering Purposes
  - 7. D 2922 Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
  - 8. D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
  - 9. D 4318 Test for Plastic Limit, Liquid Limit, & Plasticity Index of Soils
- B. American Association of State Highway and Transportation Officials (AASHTO) latest edition
  - 1. T 88 Mechanical Analysis of Soils

**1.4 QUALITY ASSURANCE**

- A. A Geotechnical Engineer, selected and paid by owner, may be retained to perform construction inspection and testing on backfilling operations. This inspection will not relieve the Contractor from his responsibility to complete the work in accordance with the plans and specifications.

**1.5 SUBMITTALS**

- A. Shop Drawings or details pertaining to Site Utilities are not required unless use of materials, methods, equipment, or procedures contrary to the Construction Drawings or these specifications are proposed. No work shall be performed until shop drawings, if required, have been accepted by the Owner and Engineer.

- B. The Contractor shall contact all utility companies and identify any requirements. Contractor shall provide written confirmation of the status of all utility construction to the Owner at the time of the preconstruction conference or no later than 30 days following the project possession date.
- C. Submit a sample of each type of offsite fill and/or bedding material that is to be used in backfilling.

**1.6 PROJECT RECORD DOCUMENTS**

- A. Accurately record actual locations of all subsurface utilities, structures and obstructions encountered.
- B. Accurately record any as-built variation from the construction plans and specifications. The Contractor shall provide as-built drawings within 30 days of project completion.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Bedding Material: AASHTO No. 67 processed sand and gravel free from debris, clay lumps, organic, or other deleterious material, and complying with following gradation requirements:
  - 1. U. S. Sieve: Size Percent Passing (by weight)
    - a. 1 Inch: 100
    - b. 3/4 Inch: 90-100
    - c. 3/8 Inch: 20-55
    - d. No. 4: 0-10
    - e. No. 8: 0-5
- B. Backfill material as approved by the owner and/or the Geotechnical Engineer.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Set all lines, elevations, and grades for utility and drainage system work and maintain for the duration of work. Provide careful maintenance of benchmarks, property corners, monuments, or other reference points.
- B. Protect and maintain in operating condition, existing utilities encountered during utility installation. Repair any damage to surface or subsurface improvements shown on Drawings.
- C. Over excavate and properly prepare areas of subgrade that are not capable of supporting the proposed systems. These areas are to be stabilized by using acceptable backfill materials and/or additional bedding material placed and compacted as specified to the satisfaction of the Geotechnical Engineer.

**3.2 EXCAVATION**

- A. Dig trenches at proper width and depth for laying pipe as detailed in the contract drawings and as specified herein. Cut trench banks for safety and remove stones as necessary to avoid point-bearing.
- B. All trench excavation side walls shall be sloped, shored, sheeted, braced or otherwise supported by means of sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to an exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.
- C. Trench width requirements below the top of the pipe shall not be less than 12" nor more than 18" wider than outside surface of any pipe or conduit that is to be installed. All other trench width requirements for pipe or conduit shall be the minimum practical width that will allow for proper compaction of trench backfill and satisfy safety and utility company regulations.

- D. Accurately grade trench bottom to an elevation 6 inches below the pipe, as per bedding details in construction drawings. Provide uniform bearing and support for each section of pipe on bedding material at every point along the entire length, except where necessary to excavate for bell holes, pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make the joint connection properly.
- E. During excavation, stockpile excavated material suitable for backfilling in an orderly manner far enough from the trench to avoid overloading, slides, or cave-ins.
- F. Remove excavated materials from the site which are not suitable for backfill.
- G. Any abandoned structures utilities or debris discovered during excavation shall be removed and disposed of, or capped.
- H. Utility alignments have been designed to avoid expected obstructions wherever possible. If unanticipated significant obstructions are encountered during utility installation work immediately notify the Owner and Engineer.
- I. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches or other excavations by pumping or other acceptable methods. Water shall not be directly pumped to the city sewer system.
- J. Utility installation shall meet the following minimum pipe installation depths, or applicable codes and ordinances, measured from finished grade or the paved surface.
  - 1. Storm Sewer: Elevations, and grades as shown on Drawings.
  - 2. Electrical Conduits: 24" minimum to top of secondary service conduits, 36" minimum to the top of primary service conduits, or as required by NEC 300-5, NEC 710-36 codes, or the local utility company requirements, whichever is deeper.

**3.3 PIPE BEDDING**

- A. Accurately cut trenches for pipe or conduit to designated line and grade 6 inches below the bottom of the pipe, to width as specified previously. Compact trench bottoms a minimum of 95% of the maximum dry density as determined by ASTM D1557, Modified Proctor Test.
- B. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide a suitable base for continuous and uniform bedding.
- C. Place bedding material and compact in 6 inch loose lifts to obtain at least 95% of the maximum dry density. Accurately shape bedding material to conform to lower portion of pipe barrel. After pipe installation, place and compact bedding material as specified above in maximum 6 inch loose layers to the springline of the pipe.

**3.4 BACKFILLING**

- A. After pipe or conduit has been installed, bedded and tested as necessary, backfill trench to finish grade in 8 inch thick loose lifts of approved fill soils, compacting and testing each lift as specified above.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces. Should these conditions exist, the areas should be removed, replaced and recompacted.

**3.5 COMPACTION**

- A. Exercise proper caution when compacting immediately over top of pipes or conduits.
- B. Maintain optimum moisture content of fill materials to attain required compaction density.

**END OF SECTION 31 23 33**

**SECTION 31 25 00 SOIL EROSION AND SEDIMENT CONTROL**

**PART 1 - GENERAL**

1.1 SCOPE OF WORK

- A. Temporary and permanent soil erosion control systems.

1.2 RELATED SECTIONS

- A. Section 31 23 33 – Trench Excavation
- B. Section 33 41 00 – Storm Sewer
- C. Contract Drawings and Documents

1.3 REFERENCE STANDARDS

- A. The Connecticut Guidelines for Erosion and Sediment Control, latest edition.

1.4 QUALITY ASSURANCE

- A. The Contractor shall carefully adhere to the construction sequence that is shown on the Contract Drawings.
- B. The Contractor shall follow Soil Erosion and Sediment Control Notes that are shown on the Contract Drawings.
- C. The Contractor shall make frequent inspection of temporary soil erosion controls and maintain them in working order until permanent soil erosion controls are established.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. The Contractor shall protect adjacent properties and water resources from soil erosion and sediment damage throughout construction.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. Quick-growing grasses such as wheat, rye or oats in accordance with Contract Drawings.
- B. Fencing for siltation control as specified on the Contract Drawings.
- C. Temporary mulches such as loose hay, straw, netting, wood, cellulose or agricultural silage.
- D. Fence stakes shall be metal stakes a minimum of 5 feet in length and be either metal stakes or 2 in x 2 in hardwood stakes driven 1' – 6" into the ground.
- E. Filter fabric as specified on the Contract Drawings, or approved equal.

**PART 3 - EXECUTION**

3.1 PREPARATION

- A. Review site conditions and sediment control plans.
- B. Review the soil erosion and sediment control plans as they apply to current conditions. Any proposed deviation from the plans must be submitted to the Owner's Engineer in writing 72 hours prior to commencing that work.

3.2 SOIL EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Place soil erosion control systems in accordance with the Contract Documents prior to any earthwork construction.

- B. Limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations by following the construction phasing on the Soil Erosion and Sediment Control Plan.
- C. The Contractor will be required to incorporate all permanent soil erosion control features into the project at the earliest practical time to minimize the need for temporary controls. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical. Equip catch basins with inlet protection immediately upon construction.
- D. The temporary soil erosion control systems installed by the Contractor shall be maintained as directed by the Owner's Engineer to control siltation at all times during the life of the contract. The Contractor must respond to any maintenance or additional work ordered by the Owner's Engineer within a 48 hour period.
- E. Slopes that erode easily shall be temporarily seeded as the work progresses with quick growing grass grains of wheat, rye or oats unless otherwise specified in the Landscape Specifications. In areas where seeding is ineffective, as determined by the City, the Owner's Engineer or other governing authorities, the Contractor shall provide fibrous netting as shown on Contract Drawings at no additional cost to the Owner.
- F. All soil erosion control measures shall be maintained until all permanent improvements to the site are complete unless otherwise directed by the Owner's Engineer.

**END OF SECTION 31 25 00**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 INTRODUCTION**

- A. Aggregate columns for subgrade stiffening shall consist of columns of compacted aggregate, aggregate with cement, or concrete columns designed and installed in a manner that reinforces the ground beneath footings and reduces settlement.
- B. Aggregate columns shall be designed and installed by the Contractor subject to the performance criteria and specifications established herein.

**1.3 WORK INCLUDED**

- A. Provide all equipment, material, labor, and supervision to design and install aggregate columns as specified herein.

The work for this section shall include, but is not necessarily limited to:

1. Developing and submitting detailed designs for aggregate columns that meet the requirements of this specification.
2. Designing and installing a temporary work platform of sufficient thickness and using materials (i.e., geogrids, geotextiles, graded aggregate, etc.) designed to avoid disturbance to the subgrade, if needed.
3. Installing aggregate columns in a manner that meets the requirements of this section.
4. Removing all spoils generated from installation of aggregate columns.
5. Field layout and surveying of column locations in advance of installation.
6. Field surveying and developing a plan showing the “as-built” locations and surface elevations of all columns installed.
7. Performing QA/QC testing on each type of column proposed for use on the project, to confirm that columns are constructed in accordance with the design assumptions.
8. Establishing settlement monitoring points on the columns directly above new footings, and surveying each settlement monitoring point as indicated herein.
9. Performing the work in a manner that will not damage existing utilities or structures.
10. Sequencing the work with related activities.



**1.4 QUALIFICATIONS**

- A. The Aggregate Column Installation Contractor shall submit qualifications and experience information that demonstrates their qualifications and experience to successfully design and install aggregate columns in accordance with this Section. The qualifications shall consist of the following:

1. Designer shall demonstrate that they possess a minimum of 10 years of aggregate pier design experience and be a licensed professional engineer in the State of Connecticut. The designer shall submit a list of a minimum of five projects of similar size and complexity. The list shall include, at a minimum, the name of the project, location, client, and contact information.

2. Installation Contractor shall demonstrate that they possess a minimum of 10 years of aggregate pier installation design experience. The installation contractor shall submit a list of a minimum of five projects of similar size and complexity. The list shall include, at a minimum, the name of the project, location, client, and contact information.

3. The Installation Contractor shall demonstrate that the proposed Superintendent has a minimum of five years of installation on projects of similar size and complexity.

4. A detailed discussion of the method used and the settlement reduction achieved by the method.

5. A reference statement from a recent project Owner or Engineer and current contact information, so that project performance can be independently verified.

The Owner will review the information submitted, and make the final decision as to whether the Designer and Aggregate Column Installation Contractor has the required qualifications and experience.

**1.5 RELATED SECTIONS:**

- A. Section 00 31 32 – Geotechnical Data
- B. Section 31 20 00 – Earthwork

**1.6 EXISTING CONDITIONS**

- A. The Contractor shall examine the site, records of existing utilities and construction, test boring logs, and the results of laboratory testing to determine conditions under which the Work will be performed.
- B. Subsurface information has been developed by the Owner and is available for the Contractor's review. This information is intended for reference purposes only, and is not part of the contract documents. The available geotechnical report is referenced in Section 00 31 32, Geotechnical Data.

**1.7 PERFORMANCE CRITERIA**

- A. Aggregate columns beneath footings shall be advanced a sufficient distance and be installed at a spacing to limit settlement to the settlement criteria below.
- B. Aggregate columns beneath footings shall be designed and installed to meet the following criteria: 1) 6,000 psf

allowable footing bearing pressure; 2) less than 1-inch maximum total long-term settlement of footings; 3) less than 3/4-inch maximum long-term differential settlement of adjacent footings.

- C. Columns shall be designed to preclude bulging and excessive stresses in the column.
- D. The results of the modulus test shall confirm the Contractor's design parameters for aggregate columns. If the results of modulus testing do not confirm the aggregate column design, the column design shall be revised and an additional modulus test shall be performed, at no additional cost to the Owner.
- E. The Contractor shall be responsible for all damage related to subgrade soils or adjacent structures resulting from work under this section.

#### 1.8 SUBMITTALS

- A. Qualifications and experience information that demonstrates ability to design and install aggregate columns in accordance with this Section, including detailed descriptions of projects of similar scope and size, a detailed discussion of the method used and the settlement reduction achieved, a reference statement from the project Owner or Engineer, and current contact information for the reference as described in Section 1.4.A above
- B. Name and qualifications of the Field Superintendent responsible for installation the aggregate columns as described in Section 1.4.A above.
- C. The aggregate column Contractor shall submit 3 sets of detailed design calculations, construction drawings, and shop drawings for approval at least 2 weeks prior to the beginning of construction. A detailed explanation of the design parameters for bearing capacity and settlement calculations shall be included. The design submitted shall consider the bearing capacity and settlement of all footings, and shall be in accordance with acceptable engineering practice and these specifications. All calculations and drawings shall be prepared and sealed by a Professional Engineer licensed in Connecticut.
- D. A quality control (QC) plan as specified herein.
- E. A plan showing the locations where settlement monitoring points will be installed on columns placed above new footings.
- F. A plan and narrative describing the modulus test. The submittal shall include proposed loads and a copy of the data record sheet.
- G. Test Data – Within one week after completion of modulus testing on aggregate columns, as required by this Section, the Contractor shall submit to the Geotechnical Engineer a description of the installation equipment, installation records, complete test data, and analysis of the test data, and recommended design parameters. The report shall be sealed by a Professional Engineer licensed in Connecticut.
- H. The Contractor shall demonstrate that the aggregate columns comply with all applicable Building Code and regulatory requirements. The Contractor shall provide a letter stamped by a Connecticut Registered Professional Engineer to the Owner stating that applicable building code and regulatory requirements have been met.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials shall be in accordance with the approved shop drawings.

PART 3 - EXECUTION

3.1 COLUMN INSTALLATION

- A. Installation of aggregate columns shall be in accordance with the approved submittal, and the column design shall be confirmed by modulus testing. Columns not installed in accordance with the approved submittal, or which are not consistent with the results of modulus testing shall be reinstalled at no additional cost.
- B. The center of each column shall be within six inches of the plan locations indicated on the approved submittal. Columns installed outside of this tolerance and deemed not acceptable shall be rebuilt at no additional cost.
- C. The Contractor shall be responsible for any disturbance to the soil subgrade, and shall remove and replace soils disturbed during installation as necessary.

3.2 MODULUS TEST

- A. Prior to the start of production aggregate column installation, at least one modulus test shall be performed for each aggregate column type installed, to verify the parameters assumed during design. Tests shall be conducted at representative locations subject to the approval of the Geotechnical Engineer.
- B. The test shall consist of applying loads to a steel plate placed over the aggregate column and measuring deflection. Tests shall be conducted in increments to 150 percent of the design stress.
- C. Upon completion of the modulus test, the Contractor shall submit a report summarizing the results of the modulus test, and confirming that the test results indicate that the aggregate column design is appropriate. The report shall be prepared by a Professional Engineer registered in the State of Connecticut, and shall affirm that the aggregate column design meets the performance criteria established herein.
- D. If in the opinion of the Geotechnical Engineer, the results of modulus testing indicate that the installed columns do not meet the design parameters in the approved submittal, the Contractor's design shall be modified and an additional modulus test shall be conducted, at no additional cost to the Owner.

3.3 SETTLEMENT MONITORING

- A. After new footings (and the column or wall above the footing) have been placed, settlement monitoring points shall be established directly above the footings at locations designated by the Contractor and approved by the Geotechnical Engineer. Settlement monitoring points shall be established above footings on each column.
- B. Additional settlement monitoring points shall be established if necessary, as directed by the Geotechnical Engineer.

- C. Settlement monitoring points shall consist of targets fixed to the column.
- D. Settlement monitoring points shall be surveyed weekly until construction is complete, and the results of the survey shall be provided to the Geotechnical Engineer within 24 hours after survey measurements are made. Additional survey measurements shall be made if directed by the Geotechnical Engineer. Survey measurements shall have a vertical accuracy of 0.01 feet.
- E. Settlement monitoring points that are damaged or must be replaced during construction shall be re-established and re-surveyed.

### 3.4 VIBRATION MONITORING

- A. The Contractor shall perform vibration monitoring during installation of aggregate columns.
- B. Vibration monitoring equipment shall consist of Instantel Mini- or Micro-Mates or equivalent; and the calibration for equipment shall not be older than 1 year.
  - 1. Seismic range shall be 0.01 to 4 inches per second with an accuracy of + 5 percent of the measured peak particle velocity (PPV) between 10 and 100 Hz, with a resolution of 0.01 in/sec or better.
  - 2. Frequency response shall be between 2 and 200 Hz.
  - 3. Seismic monitors shall be capable of recording data in both histogram (aka continuous monitoring) and self-triggering wave-form modes that will record and plot wave forms, peak particle velocities and frequencies of measured vibrations.
  - 4. Continuous monitoring intervals shall be set to 1 minute or less.
- C. Vibration monitoring equipment shall be placed between the work and the nearest existing building to be monitored. Geophones shall be coupled to the ground in accordance with the manufacturer's recommendations. Alternatively, geophones may be coupled to the structure in accordance with the manufacturer's recommendations.
- D. Submit daily reports presenting date, time, equipment serial number, last calibration date, full waveform, peak measurements and predominant frequencies.
- E. Limit measured PPVs to 0.5 in/sec. PPV shall be the vector sum of the three perpendicular measurements.
- F. If measured PPVs exceed 0.5 in/sec., modify the aggregate column installation process to comply with the maximum allowable PPV.

### 3.5 QUALITY CONTROL

- A. The aggregate column installation Contractor shall have a full-time Quality Control (QC) representative to verify and report all QC installation procedures. The Contractor shall immediately report any unusual conditions encountered during installation to the Geotechnical Engineer and Architect. The QC procedures shall include the preparation of aggregate column Progress Reports completed during each day of installation and containing the following information:
  - 1. Footing and aggregate column location.

2. Aggregate column length and diameter.
3. Planned and actual aggregate column elevations at the top and bottom of the element.
4. Soil types encountered at the bottom of the aggregate column and along the length of the element.
5. Depth to groundwater.
6. Documentation of any unusual conditions encountered.
7. Type and size of equipment used.
8. Amount of anticipated aggregate for each column and actual amount used.

END OF SECTION

**SECTION 32 00 00 GENERAL SITE REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK**

- A. The work generally includes, but is not limited to, the following:
  - 1. Soil Erosion and Sediment Control Measures
  - 2. Placement of Compacted Fill
  - 3. Storm Drainage
  - 4. Construction of Curbs
  - 5. Paving of Parking Areas and Drives
  - 6. Striping and Signage
  - 7. Utilities
- B. Associated work items as described in the Contract Drawings and Documents and all construction methods and procedures necessary for the performance of the work.
- C. The Site Contractor shall provide adequate personnel, facilities, material, and equipment to complete the work shown on the Contract Drawings and Documents and as specified herein and in accordance with the requirements of the City within the agreed upon schedule. When these specifications are at variance, the more restrictive requirements shall apply. The Contractor shall employ a qualified supervisor to provide adequate and efficient coordination of the Work and to adhere to all requirements set forth in this specification and general construction practices within the State of Connecticut and those required by the City. The Supervisor shall be present on the site on a continuous full-time basis and have authority to act on behalf of the Contractor.
- D. The Contractor shall obtain and pay for the construction of all related site work. The Contractor shall pay for all other fees and services, give notice, file necessary drawings, and obtain permits and certificates of approval required in connection with the related work of their contracts, comply with laws, ordinances, rules and regulations of departments having jurisdiction over this work.
- E. Additional Owner and Engineer time for repeat inspections of punch list items after the initial inspections will be charged to the Contractor in the form of a deductive change order.

**1.2 CONTRACTOR TO ACCEPT SITE CONDITIONS AND CONTRACT DOCUMENTS**

- A. The Contractor shall accept the site as is. The Contractor shall make and shall be deemed to have made a thorough site inspection in order to field check existing site conditions, correlate conditions with the drawings and resolve any possible construction conflicts with the Owner and Owner's Engineer prior to commencement of work. This includes a topographic survey of any areas the Contractor requires additional topographic information, and subsurface utility investigations. Any conditions that differ from the existing conditions shown on the drawings that are not brought to the attention of the Owner and Owner's Engineer prior to the start of work shall not be considered grounds for a change order.
- B. The work to be performed is as shown on the Contract Drawings. Attempts have been made to note all specific items on the drawings. The contractor is responsible for means and methods of construction; as such, these plans may not completely represent all specific site details of installation required for sitework construction. Contractor is responsible to provide all improvements required to achieve construction depicted on these plans. Incidental items not included in the Contract Documents shall be constructed in accordance with standard engineering or architectural requirements. It shall be the Contractor's responsibility to repair or replace any existing facilities (utilities, streets, sidewalks, etc.) damaged by him during the work. Such repairs or replacement shall be done at the Contractor's own expense to the satisfaction of the Owner.

- C. The Contractor shall provide written requests for information to the Owner and Owner's Engineer prior to the construction of any specific sitework item if any sitework item depicted on the plans warrants additional engineering information required for construction and is not related to means and methods of construction. The Contractor shall be responsible for sitework items installed differently than intended as depicted on the plans in the absence of submitting and receiving reviews and/or direction on written requests for information from the Owner or Owner's Engineer.
- D. It is specifically noted that information related to elevations and proposed utilities (such as roadway grades, invert elevations, rim elevations, grate elevations, building finished floor elevations, etc.) may be found in more than one location on the contract documents. Contractor shall specifically review all plans, profiles and any information/data tables for consistency prior to construction. Any inconsistencies or discrepancies that are found shall immediately be brought to the attention of the Owner's Engineer in writing requesting clarification prior to construction.
- E. Contractor is specifically noted that there are additional notes, specifications and requirements contained on sheets throughout the plan set and available references to specifications from applicable governing authorities and industry standards. It is the contractor's responsibility to obtain, review and adhere to all applicable requirements.
- F. Contractor's acceptance of the project contract specifically binds the contractor to the requirements noted above and contained in this entire document.

**1.3 INDEMNIFICATION**

- A. The Contractor shall indemnify and save harmless the Owner, and its respective agents, officers, employees and Owner's Engineer (herein collectively called the "indemnities") from and against any and all liability, loss, damages, interest, judgments and liens growing out of, and any and all costs and expenses (including, but not limited to, counsel fees and disbursements) arising out of, or incurred in connection with, any and all claims, demands, suits, actions, or proceedings which may be made or brought against any of the indemnities for or in relation to any violation of this Contract, the laws, statutes, ordinances, rules, regulations, executive orders and agreements herein provided or any injuries, including death at any time resulting therefrom, sustained by any person or persons, or on account of any damage to property, arising out of or in consequence of the performance of or the failure to perform the contract, whether or not such injuries to persons or damage to property are due or claimed to be due to any negligence of the Contractor or its employees, agents, subcontractors or materialmen, the indemnities or any other person.

**1.4 WARRANTIES**

- A. The Contractor shall correct defective work at the Contractor's expense which appears within one year's time from acceptance of work. Failure of Contractor to correct such defects within a reasonable time after being notified to do so shall permit the Owner to cause such defects to be corrected and charge the Contractor the cost of corrections.
- B. The Contractor shall submit to the Owner and Owner's Engineer all material warranties supplied by manufacturers.

**1.5 GENERAL QUALITY ASSURANCE**

- A. References and Standards: The Contractor shall comply with all rules, regulations, laws and ordinances of all Authorities having jurisdiction. All labor, materials, equipment, and services necessary to make the work comply with such requirements shall be provided without additional cost. All Standards shall be the latest edition and revisions.
- B. The Contractor shall deliver material to the site, in the approved Manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples. Certifications for materials shall be included with the shipment.
- C. The Contractor shall store material under cover (if appropriate) in a clean, dry, above-ground location, and remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

**1.6 SECURITY**

- A. Protect work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
- B. Initiate and maintain security program as described herein throughout construction period until Owner acceptance precludes the need for Contractor security.
- C. Restrict entrance of persons and vehicles into project site. Allow entrance only to authorized persons with proper identification. Maintain log of workers and visitors, make available to Owner on request.
- D. Maintain a list of authorized persons; submit copy to Owner on request.

**1.7 SAFETY PROVISIONS:**

- A. Site safety is entirely the responsibility of the Contractor. The Contractor is hereby made aware that the Owner's Engineer does not have the authority to stop the work on the grounds of unsafe work practices.
- B. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations as required by all authorities having jurisdiction bearing on the conduct of the Work as specified.
- C. If any of the Contractor's work is performed contrary to such laws, ordinances, rules and regulations, and/or without the required notices, he shall bear all cost arising therefrom.
- D. The Contractor shall also give prior written notice to all concerned utility companies, agencies, authorities, owners, etc., at least 48 hours in advance of commencing any work on this Contract.
- E. Maintenance materials, including extra materials, spare parts, tools, and software.

**1.8 SUBMITTALS:**

- A. General:
  - 1. The Contractor shall submit to the Owner's Engineer sufficient documentation from the manufacturers that all material and products used by the Contractor meet the required specifications. Such documentation shall be submitted and reviewed prior to the delivery of the material.
  - 2. This documentation shall include shop drawings, vendor drawings, manufacturer's specifications and catalog cuts. The shop drawings shall include plans, elevations, sections and details of the work showing in detail the methods of installation and all data and assumptions considered in the design.
  - 3. The Owner's Engineer will review appropriate documentation for general compliance to the specifications prior to delivery. The Owner's Engineer's review will be made on a timely basis.
  - 4. The review of the Owner's Engineer or failure to review shall not be construed as permitting any departure from Contract requirements, or as relieving the Contractor of responsibility for any errors, including details, dimensions or materials. If submittals show variations from Contract requirements, the Owner's Engineer may review such variations, subject to a proper adjustment in the Contract. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing work in accordance with the Contract Documents even though such submittals identifying other variations have been reviewed. It is specifically noted that variations from items depicted on the plan require the review and approval of the City Engineer.
  - 5. All submittals required by specifications shall be submitted, unless otherwise stated herein, as follows:
    - a. Specifications – Three copies of material specifications shall be submitted to the Owner's Engineer unless agreed that less copies will be sufficient.
    - b. Shop Drawings – A reproducible and two copies shall be submitted to the Owner's Engineer.



6. The work shall not begin until all required submittals for each segment of work have been reviewed.

**1.9 PROJECT COORDINATION**

- A. Cooperate with the Owner when necessary in allocation of mobilization areas of the site for field offices and sheds, for access, traffic and parking facilities.
- B. Comply with Owner procedures for intraproject communications; submittals, reports and records, schedules, coordination drawings, and recommendations and resolution of ambiguities and conflicts.
- C. Comply with instructions of the City and the Owner for use of temporary utilities and construction facilities.
- D. Submit preliminary progress schedule and coordinate with project construction schedule. After review, revise and resubmit schedule to comply with revised project schedule. During progress of work revise and resubmit as directed.
- E. Provide information required by Owner and Owner's Engineer for preparation of coordination drawings.
- F. Notify Owner and Owner's Engineer when work is considered ready for substantial completion. Accompany Owner's Engineer on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion and punchlist.

**1.10 PROGRESS SCHEDULE**

- A. The Contractor shall submit a detailed schedule for approval by the Owner before beginning work and shall adhere to the approved schedule. The schedule, which shall list all major and minor construction tasks, and shall be based on the requirements set forth by the Owner and Construction. All work shall be done in a continuous manner unless otherwise directed by the Owner and Construction Manager and shall be completed at a satisfactory rate of progress. If in the opinion of the Owner, or his/her representative, work is not being done at a satisfactory rate of progress, the Owner may order the Contractor to increase his work force to insure completion of the project on schedule.

**1.11 PERMIT APPLICATIONS AND COMPLIANCE**

- A. The Contractor shall carefully plan and coordinate his work so as to comply with all criteria, conditions and the intent of all project permits.

**1.12 ENVIRONMENTAL PROTECTION**

- A. It is the Contractor's responsibility to assure himself that all applicable Federal, State and local laws, concerning pollution and environmental protection are being complied with by his personnel and subcontractors.
- B. When Contractor is in, or it is anticipated that any part of the work may become in non-compliance with applicable Federal, State, and local laws or regulations, the Owner may issue an order stopping all or part of the work until satisfactory corrective actions have been taken, or may order supplemental actions to be taken to stay in, or come into, compliance. No part of the time lost due to any such stop order shall be made subject of a claim for extensions of time, or for extra compensation or damages by the Contractor.
- C. In particular, the Contractor shall not allow the discharge of concrete, mortar, grout, gasoline, diesel, or the washing from vessels containing these materials, or other construction materials, into public areas, onto adjacent properties or the sewage or stormwater conveyance systems.
- D. Contractor shall provide and maintain all facilities necessary for pollution control under this Contract as long as construction operations continue.

**1.13 CONTRACTOR'S REPRESENTATIVES**

- A. The Contractor shall provide and maintain a capable and experienced field person to oversee all contract operations. The Contractor shall submit references for his proposed representative to, and obtain approval from, the Owner and/or Owner's Engineer prior to the start of construction. The representative shall be on-site during all operating hours of the project.

- B. As appropriate, the Contractor or his subcontractors shall provide qualified supervisory personnel for specialist aspects of the work, such as concrete, landscaping, and site furnishings.

**1.14 SITE ACCESS**

**A. General**

1. The Contractor shall construct any construction access ways shown on the Drawings or as required prior to the execution of his work. The contractor shall be required to maintain all necessary access and parking areas, haul roads, ramps and any other temporary facilities required by the Owner to insure safe and satisfactory operation of the facility and completion of the work in accordance with the schedule. Cleanliness of off-site streets (both private and public) shall be maintained by the Contractor throughout construction. All public and private roadways shall be kept free of debris and sediment that result from the subject work. The contractor will provide daily sweeping if required by the City.
2. The Contractor shall coordinate construction fencing with the Owner.

**1.15 EXISTING CONDITIONS, UTILITIES AND STRUCTURES**

- A. Prior to the beginning of any grading work, the Contractor shall make sufficient checks on the topographic conditions and subsurface utilities to satisfy himself that the existing information as shown on the topographic survey and contract documents are adequate for construction. Should any discrepancies be found, they shall be reported to the Owner's Engineer immediately. Claims for extras due to discrepancies in the existing conditions will not be reviewed if the Owner's Engineer and Owner are not notified immediately (within 24 hours of beginning of site work).
- B. Verify Locations: Locations of existing underground utilities and structures as shown on the Contract Documents are approximate and may not necessarily be complete. These locations must be verified by the Contractor prior to construction. It is specifically noted that the contractor may require the use of a utility location service in the event the Contractor deems it necessary to perform this verification.
- C. Prior to construction of the sanitary, water, gas, electric, telephone, cable and storm sewer systems, the Contractor shall conduct test pits at all proposed utility crossings with existing underground utilities and/or storm pipes. Elevations of existing utilities shall be accurately recorded and submitted to the Owner's Engineer for verification of the proposed design. Any necessary adjustments to the proposed design will be made by the Owner's Engineer in a timely manner.
- D. The Contractor is specifically made aware that the exact depth and location of the off-site water and gas mains are unknown. The Contractor shall perform test pits prior to installation of the new laterals where shown on the plans to verify the depth and location of existing connection points.
- E. Avoid Damage: The Contractor shall exercise care to avoid damage to all existing structures, poles, utilities, pipes, etc. which are scheduled to remain. In locations where the excavation is carried beneath or adjacent to such facilities, the Contractor shall adequately support such structures, utilities or pipes as necessary to remain in operation and maintain their original position. The Contractor shall be responsible for any damage caused to any utilities by this work, and shall repair any damage without charge to the Owner.
- F. The Contractor shall provide written requests for information to the Owner and Owner's Engineer prior to the construction of any specific item if any specific item depicted on the plans warrants additional information required for construction and is not related to means and method of construction. The Contractor shall be responsible for specific sitework items installed differently than intended as depicted on the plans in the absence of submitting and addressing written requests for information.

**PART 2 - PRODUCTS**

- 2.1 Use materials appropriate to the work, and meeting with the Owner's Engineer's approval.

**PART 3 - EXECUTION**

- 3.1 Execute general measures as appropriate, and meeting with the Owner's Engineer's approval.

END OF SECTION 32 00 00

**SECTION 32 12 16 ASPHALTIC CONCRETE PAVING**

**PART 1 - GENERAL**

1.1 SECTION INCLUDES

- A. Preparation and placement of asphaltic concrete binder course.
- B. Preparation and placement of asphaltic concrete surface course.

1.2 RELATED SECTIONS

- A. Section 32 16 13 - Curb and Sidewalks
- B. Section 32 17 23 - Pavement Markings
- C. Connecticut Department of Transportation Standard Specifications, latest edition.
- D. Contract Drawings and Documents

1.3 REFERENCE STANDARDS

- A. The Asphalt Institute (AI) latest edition
  - 1. MS 2 Mix Design Methods for Asphaltic Concrete and Other Hot Mix Types
  - 2. MS 3 Asphalt Plant Manual
  - 3. MS 19 Basic Asphalt Emulsion Manual
- B. US Army Corp of Engineers
  - 1. UN-13 Hot Mix Asphalt Paving Handbook, (CE MP-ET)
- C. American Society of Testing and Materials (ASTM) latest edition
  - 1. D 946 Penetration - Graded Asphalt Cement for use in Pavement Construction
  - 2. D 1188 Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
  - 3. D 1559 Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
- D. American Association of State Highway and Transportation Officials (AASHTO) latest edition
  - 1. M 117 Mineral Filler "Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing"
  - 2. M 140 Tack Coat "Emulsified Asphalt"
  - 3. M 208 Tack Coat "Cationic Emulsified Asphalt"
  - 4. M 226 Viscosity Graded Asphalt Cement
  - 5. T 245 Marshall Mix Design
- E. Connecticut Department of Transportation Standard Specifications, latest edition.

1.4 QUALITY ASSURANCE

- A. At the discretion of the Owner, an Engineer, selected and paid by Owner (herein referenced to as "Owner's Engineer", may be retained to perform construction testing of in-place asphaltic concrete courses for compliance with requirements for thickness, compaction, and surface smoothness. Asphaltic surface and base courses shall be randomly cored at minimum rate of 1 core per 20,000 sq. ft of paving. However, no less than 3 cores in light duty areas and 3 cores in heavy duty areas shall be obtained. Coring holes shall be immediately filled with full-depth asphaltic concrete. Asphaltic concrete pavement samples shall be tested for conformance with mix design.
- B. Establish and maintain required lines and elevations.

- C. In-place compacted thickness shall not be less than thickness specified on Contract Documents. Areas of deficient paving thickness shall receive tack coat and minimum 1-in. overlay; or shall be removed and replaced to proper thickness, at discretion of Owner; until specified thickness of course is met or exceeded at no additional expense to Owner.
- D. Testing shall be performed on finished surface of each asphalt concrete course for smoothness, using 10-ft straightedge applied parallel with, and at right angles to centerline of paved area. Results of tests shall be made available to Owner upon request. Surfaces will not be acceptable if the following 10-ft straightedge tolerances for smoothness are exceeded:
  - 1. Base Course Surface: 1/4-inch
  - 2. Wearing Course Surface: 3/16-inch
- E. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable paving as directed by Owner.
- F. Field density test for in-place materials shall be performed by examination of field cores in accordance with one of following standards:
  - 1. Bulk specific gravity of paraffin-coated specimens: ASTM D 1188.
  - 2. Bulk specific gravity using saturated surface-dry specimens: ASTM D 2726.
- G. Rate of testing shall be 1 core per 20,000 sq. ft of pavement, with minimum of 3 cores. Cores shall be cut from areas representative of project. Areas of insufficient compaction shall be delineated, removed, and replaced in compliance with Specifications at no additional expense to Owner.

#### 1.5 SUBMITTALS

- A. Design Mix: Before any asphaltic concrete paving is constructed, submit actual design mix to the Owner's Engineer for review and/or approval. Design mix submittal shall follow the format as indicated in the Asphalt Institute manual MS-2, Marshall Stability Method; and shall include the type/name of the mix, gradation analysis, grade of asphalt cement used, Marshall Stability (lbs.), flow, effective asphalt content (percent), and direct references to the Standard Specifications sections for each material. The design shall be for a mixture listed in the current edition of the Standard Specifications. Mix design over three (3) years old will not be accepted by the Owner's Engineer.
- B. Material Certificates: Submit materials certificate to the Owner's Engineer which is signed by material producer and Contractor, certifying that materials comply with, or exceed, the requirements herein.
- C. Testing Results: Results of concrete, steel and paving tests performed by Contractor's testing laboratory shall be submitted to Owner's Engineer in a timely manner.
- D. The results of Marshal Tests for the day of installation shall be submitted to the Field Engineer with the first truck delivery each day of asphalt placement.

#### 1.6 PROJECT CONDITIONS

- A. Weather Limitations:
  - 1. Apply prime and tack coats when ambient temperature is above 40 degrees Fahrenheit, and when temperature has been above 35 degrees Fahrenheit for 12 hours immediately prior to application. Do not apply when base is wet, contains excess moisture, or during rain.
  - 2. Construct asphaltic concrete paving when atmospheric temperature is above 40 degrees Fahrenheit.
- B. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Provide asphalt-aggregate mixture to meet Connecticut Department of Transportation standards.
- B. Asphalt Cement: Comply with AASHTO M 226; Table 2 AC-10, AC-20, or AC-30, viscosity grade, depending on local mean annual air temperature. See chart below:
  - 1. Temperature Condition: Asphalt Grades
    - a. Cold, mean annual air temperature at 45 degrees Fahrenheit or lower: AC-10, 85/100 pen.
    - b. Warm, mean annual air temperature between 45 degrees Fahrenheit and 75 degrees Fahrenheit: AC-20, 60/70 pen.
    - c. Hot, mean annual air temperature at 75 degrees Fahrenheit or higher: AC-30
    - d. Prime Coat: Medium curing cut-back asphalt or asphalt penetrating prime coat consisting of either MC-30 or SS-1h.
- C. Tack Coat: Emulsified asphalt; AASHTO M 140 or AASHTO M 208, SS-1h, CSS-1, or CSS-1h, diluted with 1 part water to 1 part emulsified asphalt.
- D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with AASHTO M 117, if recommended by state highway department specifications.
- E. Asphalt-Aggregate Mixture: Unless otherwise noted on Contract Documents, Design Mix shall have minimum stability based on 50-blow Marshall complying with ASTM D 1559 of 1000 lb with flow between 8 and 16. The Design Mix shall be within sieve analysis and bitumen ranges specified below unless approved otherwise by Owner prior to placement.
  - 1. SIEVE ANALYSIS OF MIX
    - a. Square Sieve: Total Percent Passing
      - 1) 1/2": 100%
      - 2) 3/8": 80 - 100%
      - 3) #4: 50 - 75%
      - 4) #8: 30 - 60%
      - 5) #16: 20 - 45%
      - 6) #30: 15 - 35%
      - 7) #50: 10 - 30%
      - 8) #200: 4 - 10%
    - b. Percent bitumen by weight of total mix: 5.0 - 8.5 percent
    - c. Air voids: 3 - 6 percent
    - d. Aggregate voids filled with asphalt cement: 70 - 82 percent
    - e. Allowable variance of bitumen by weight of total mix = 0.4 percent

**2.2 EQUIPMENT**

- A. Maintain equipment in satisfactory operating condition and correct breakdowns in manner that will not delay or be detrimental to progress of paving operations.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Proofroll prepared base material surface to check for unstable areas. Paving work shall begin only after unsuitable areas have been corrected and are ready to receive paving.
- B. Remove loose material from compacted base material surface immediately before applying prime coat.

**3.2 APPLICATIONS**

**A. Prime Coat:**

- 1. Apply bituminous prime coat to base material surfaces where asphaltic concrete paving will be constructed.
- 2. Apply bituminous prime coat in accordance with Connecticut Department of Transportation Standard Specifications, latest edition.
- 3. Apply at minimum rate of 0.25 gal per sq. yd over compacted base material. Apply to penetrate and seal, but not flood surface.
- 4. Take necessary precautions to protect adjacent areas from overspray.
- 5. Cure and dry as long as necessary to attain penetration of compacted base and evaporation of volatile substances.

**B. Tack Coat:**

- 1. Apply to contact surfaces of previously constructed asphaltic concrete base courses or Portland cement concrete and surfaces abutting or projecting into asphaltic concrete or into asphaltic concrete pavement.
- 2. Apply tack coat to asphaltic concrete base course. Apply emulsified asphalt tack coat between each lift or layer of full depth asphaltic concrete bases and on surface of bases where asphaltic concrete paving will be constructed.
- 3. Apply emulsified asphalt tack coat in accordance with Connecticut Department of Transportation Standard Specifications.
- 4. Apply at minimum rate of 0.05 gal per sq. yd of surface.
- 5. Allow to dry until at proper condition to receive paving.

**3.3 ASPHALTIC CONCRETE PLACEMENT**

- A. Place asphaltic concrete mixture on completed compacted subgrade surface, spread, and strike off. Spread mixture at following minimum temperatures:
  - 1. Ambient temperature between 40 degrees Fahrenheit and 50 degrees Fahrenheit, mixture temp. = 285 degrees Fahrenheit
  - 2. Ambient temperature between 50 degrees Fahrenheit and 60 degrees Fahrenheit, mixture temp. = 280 degrees Fahrenheit
  - 3. Ambient temperature higher than 60 degrees Fahrenheit, mixture temp. = 275 degrees Fahrenheit
- B. Whenever possible, pavement shall be spread by finishing machine; however, inaccessible or irregular areas may be placed by hand methods. Hot mixture shall be spread uniformly to required depth with hot shovels and rakes. After spreading, hot mixture shall be carefully smoothed to remove segregated course aggregate and rake marks. Rakes and lutes used for hand spreading shall be type designed for use on asphalt mixtures. Loads shall not be dumped faster that they can be properly spread. Workers shall not stand on loose mixture while spreading.
- C. Paving Machine Placement: Apply successive lifts of asphaltic concrete in transverse directions with surface course placed parallel to flow of traffic. Place in typical strips not less than 10-ft wide.

- D. Joints: Make joints between old and new pavements, or between successive days and work in manner that will provide continuous bond between adjoining work. Construction joints shall have same texture, density, and smoothness as other sections of asphaltic concrete course. Clean contact surfaces of joints and apply tack coat.

**3.4 ROLLING AND COMPACTION**

- A. Mixture, after being spread, shall be thoroughly compacted by rolling as soon as it will bear the weight of rollers without undue displacement. Number, weight, types of rollers, and sequences of rolling operations shall be such that required density and surface are consistently attained while mixture is in workable condition.
- B. The bituminous concrete pavement shall have a minimum thickness as specified on the Contract Documents and should be compacted to a minimum of 96% of the maximum unit weight as determined by the Marshall Mix Design Procedures in accordance with ASTM D-1559.
- C. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- D. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling with hot material.
- E. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
- F. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
- G. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot asphaltic concrete. Compact by rolling to maximum surface density and smoothness.
- H. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.
- I. Scheduling: After complete placement of the base course the contractor may be required to remobilize for the placement of the top course. This schedule requirement will be based on the building progress, and fully at the discretion of the Owners Engineer.

**END OF SECTION 32 12 16**

**SECTION 32 13 13 PORTLAND CEMENT CONCRETE PAVING**

**PART 1 - GENERAL**

1.1 SECTION INCLUDES

- A. Preparation and placement of Portland cement concrete sidewalks, dumpster pad area and other concrete areas identified on Contract Documents.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 31 23 16 - Excavation, Backfill, and Subgrade Preparation for Pavement
- B. Connecticut Department of Transportation Standard Specifications, latest edition.
- C. City of New Britain requirements
- D. Contract Drawings and Documents

1.3 REFERENCE STANDARDS

- A. American Concrete Institute (ACI) latest edition
  - 1. 301 Specifications for Structural Concrete for Buildings
  - 2. 304R Guide for Measuring Mixing, Transporting and Placing Concrete
  - 3. 308 Standard Practice for Curing Concrete
- B. American Society for Testing and Materials (ASTM) latest edition
  - 1. A 185 Steel Welded Wire Fabric, Plain for Concrete Reinforcement
  - 2. C497 Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
  - 3. A615 Deformed and Plain Billet-Steel for Concrete Reinforcement
  - 4. C33 Concrete Aggregates
  - 5. C 94 Ready-Mixed Concrete
  - 6. C 150 Portland Cement
  - 7. C 260 Air-Entraining Admixtures for Concrete
  - 8. D 309 Liquid Membrane-Forming Compounds for Curing Concrete
  - 9. C494 Chemical Admixtures for Concrete
  - 10. C1751 Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- C. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.
- D. Connecticut Department of Transportation Standard Specification, latest edition.

1.4 QUALITY ASSURANCE

- A. The Contractor shall pay for the services of a test laboratory, approved by the Engineer, for concrete inspection. The test laboratory shall have at least one Professional Engineer on staff and shall submit proof that any concrete inspectors used on the project shall have successfully completed the ACI course in Concrete Inspection within the past year.
- B. Establish and maintain required lines and elevations.
- C. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner's Engineer.
- D. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.



- E. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of material.

**1.5 SUBMITTALS**

- A. Submit materials certificate to the Owner's Engineer, which is signed by materials producer and Contractor, certifying that materials comply with, or exceed, requirements specified herein.
- B. The Contractor shall retain an independent testing agency to perform the required tests. The Contractor shall provide any necessary assistance to the testing agency and provide the testing agency with the intended construction schedule at least one week prior to the start of construction.
- C. Submit concrete mix design to the Owner's Engineer for review at least 14 days prior to use.
- D. Testing results of concrete, steel and paving tests performed by Contractor's testing laboratory shall be submitted to Owner's Engineer in a timely manner.

**1.6 PROJECT CONDITIONS**

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.
- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185.
- C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
- D. Concrete materials: Comply with applicable requirements for concrete materials, admixtures, bonding materials, curing materials and others as required. Concrete shall have a minimum 28-day compressive strength of 4000 psi.
- E. Joint Sealers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751 FS HH-F-341, Type II, Class A.
- F. Welded wire fabric as indicated on Contract Documents.

**2.2 MIX DESIGN AND TESTING**

- A. Concrete mix design and testing shall comply with requirements of ACI.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following properties:
  - 1. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated on Contract Documents.
  - 2. Slump Range: 4-inches +/- 1-inch at time of placement
  - 3. Air Entrainment: 4 to 7 percent

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Proof-roll prepared base material surface to check for unstable areas. Paving work shall begin only after unsuitable areas have been corrected and are ready to receive paving. Compaction testing for the base material shall be completed prior to the placement of the paving.

- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

A. Form Construction

1. Set forms to require grades and lines, rigidly braced and secured.
2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
3. Check completed formwork for grade and alignment to following tolerances:
  - a. Top of forms not more than 1/8-inch in 10-ft
  - b. Vertical face on longitudinal axis, not more than
  - c. 1/4-inch in 10-ft
4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
5. Install 4-inch x 4-inch welded wire fabric as indicated on Contract Documents. Support wire on metal wire chairs to ensure that wire stays mid-depth of sidewalk section during concrete pour.

- B. Reinforcement: Locate, place and support reinforcement in accordance with Contract Documents and ACI.

C. Concrete Placement

1. Place concrete in accordance with requirements of Connecticut Department of Transportation Standard Specifications and ACI requirements.
2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Concrete shall not be placed around manholes or other structures until they are at required finish elevation and alignment.
3. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place construction joint. Automatic machine may be used for curb and gutter placement at Contractor's option. Machine placement must produce curbs and gutters to required cross-section, lines, grades, finish and jointing as specified for formed concrete. If results are not acceptable, replace with formed concrete as specified.
4. Concrete placement in poor weather conditions shall be subject to limitation of ACI.

- D. Joint Construction: Construct expansion, weakened-plane control or contraction, and construction joints straight with face perpendicular to concrete surface. Construct traverse joints perpendicular to centerline, unless otherwise detailed.

1. Weakened-Plane Control or Contraction Joints: Provide joints per the drawings. Construct control joints for depth equal to at least 1/4 concrete thickness, as follows:
2. Form tooled joints in fresh concrete by grooving top with recommended tool and finishing edge with jointer.
3. Form sawed joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.

- E. Construction Joints: Place concrete joints at end of placements and at locations where placement operations are stopped for period of more than 1/2 hour, except where such placements terminate at expansion joints. Construct joints using standard metal keyway-section forms.

- F. Expansion Joints: Locate expansion joints per the drawings. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, sidewalks, and other fixed objects.
- G. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.

**3.3 CONCRETE FINISHING**

- A. After striking off and consolidating concrete, smooth surface by screening and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10-ft straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.
- B. Work edges of sidewalks, gutters, back top edge of curb, and formed joints with edging tool, rounding edge to 1/2-inch radius. After completion of floating and trowelling, when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
  - 1. Paving: provide course, nonslip finish by scoring surface with stiff-bristled broom perpendicular to flow of traffic.
- C. Curbs, gutters and sidewalks: Broom finish by drawing fine haired broom across surface perpendicular to line of traffic. Repeat operation as necessary to produce a fine line texture.
- D. After form removal, clean ends of joints and point up minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Owner's Engineer.
- E. Protect and cure finished concrete paving using acceptable moist-curing methods, more particularly described in "water-curing" section of ACI 308.

**3.4 BACKFILL**

- A. After the concrete has set sufficiently, the spaces in front and back of the curb or sidewalk shall be refilled to the required elevation with suitable material, which shall be compacted until firm and solid and neatly graded.

**3.5 CLEANING AND ADJUSTING**

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

**END OF SECTION 32 13 13**

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**SECTION 32 16 13 CURB AND SIDEWALKS**

**PART 1 - GENERAL**

1.1 SCOPE OF WORK

- A. Preparation and Placement of Concrete Sidewalk
- B. Preparation and Placement of Concrete Curb

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 32 12 16 – Asphaltic Concrete Paving
- B. Connecticut Department of Transportation Standard Specifications Latest Edition.
- C. Contract Drawing and Documents

1.3 REFERENCE STANDARDS

- A. American Concrete Institute (ACI) latest edition
  - 1. 301 Specifications for Structural Concrete for Buildings
  - 2. 304R Guide for Measuring Mixing, Transporting and Placing Concrete
  - 3. 308 Standard Practice for Curing Concrete
- B. American Society for Testing and Materials (ASTM) latest edition
  - 1. A 185 Steel Welded Wire Fabric, Plain for Concrete Reinforcement
  - 2. C497 Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
  - 3. A615 Deformed and Plain Billet-Steel for Concrete Reinforcement
  - 4. C33 Concrete Aggregates
  - 5. C 94 Ready-Mixed Concrete
  - 6. C 150 Portland Cement
  - 7. C 260 Air-Entraining Admixtures for Concrete
  - 8. D 309 Liquid Membrane-Forming Compounds for Curing Concrete
  - 9. C494 Chemical Admixtures for Concrete
  - 10. C1751 Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- C. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.
- D. Connecticut Department of Transportation Standard Specifications, latest edition.

1.4 QUALITY ASSURANCE

- A. The Contractor shall warrant that concrete curb and base is 4,000 psi unless otherwise noted on the Construction Documents.
- B. Establish and maintain required lines and elevations.
- C. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner or Engineer.
- D. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- E. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 30 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of material.

1.5 SUBMITTALS

- A. Submit concrete mix design to the Owner's Engineer for review at least 14 days prior to use.

1.6 PROJECT CONDITIONS

- A. Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
- B. Concrete Materials: Comply with requirements of Connecticut Department of Transportation Standard Specifications for concrete materials, admixtures, bonding materials, curing materials and others as required. Concrete shall have a minimum 28-day compressive strength of 4,000 psi.
- C. Joint Fillers: Resilient pre-molded bituminous impregnated fiberboard units complying with AASHTO M 213.
- D. Welded wire fabric as indicated on Contract Documents.

2.2 MIX DESIGN AND TESTING

- A. Concrete mix design and testing shall comply with requirements of ACI as they relate to Cast-in-Place Concrete.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce the following properties:
1. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated on the Contract Drawings.
  2. Slump Range: 3-inches +/- 1-inch at time of placement
  3. Air Entrainment: 4 to 7 percent

**PART 3 - EXECUTION**

3.1 PREPARATION

- A. Proof-roll prepared base material surface to check for unstable areas. The paving work shall begin after any unsuitable areas have been corrected and are ready to receive paving. Compaction testing for the base material shall be completed prior to the placement of the paving.
- B. Surface Preparation: Remove loose material from compacted base material surface to produce a firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

- A. Form Construction
1. Set forms to required grades and lines, rigidly braced and secured.
  2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place a minimum of 24 hours after concrete placement.
  3. Check completed formwork for grade and alignment to following tolerances:
  4. Top of forms not more than 1/8-inch in 10-ft.

5. Vertical face on longitude axis, not more than 1/4-inch in 10-ft.
6. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.
7. Install 6-inch x 6-inch welded wire fabric as indicated on Contract Documents. Support wire on metal wire chairs to ensure that wire stays mid-depth of sidewalk section during concrete pour.

B. Concrete Placement

1. Comply with applicable requirements of ACI and Architectural Specifications.
2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Concrete shall not be placed around manholes or other structures until they are at the required finish elevation and alignment.
3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of dowels, and joint devices.
4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 2 hours, place construction joint. Automatic machine may be used for curb and gutter placement at Contractor's option. Machine placement must produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, replace with formed concrete as specified.
5. Concrete placement shall be conducted in accordance with related ACI recommended procedures.

C. Joint Construction

1. Transverse Expansion Joints: Transverse expansion joint in sidewalk shall have the filler cut to the exact cross section of the sidewalk. The joints shall be similar to the type of expansion joint used in the adjacent pavement. Joint spacing as specified on the plans.

D. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 2-inches or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.

E. Joint Sealants: All joints shall be sealed with approved exterior pavement joint sealants and shall be installed per manufacturer's recommendations.

3.3 CONCRETE FINISHING

A. After striking off and consolidating concrete, smooth surface by screening and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10-ft straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.

B. Work edges of sidewalks, gutters, back top edge of integral curb, and formed joints with an edging tool, and round to 2-inch radius. Eliminate tool marks on concrete surface. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing as follows:

1. Inclined Slab Surfaces: Provide coarse, non-slip finish by scoring surface with stiff-bristled broom perpendicular to line of traffic.
2. Curbs, gutters, and sidewalks: Broom Finish by drawing fine-hair broom across surface perpendicular to line of traffic. Repeat operation as necessary to produce a fine line texture.

- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed.
- D. Protect and cure finished concrete paving using acceptable moist-curing methods, more particularly described in the "water-curing" section of ACI 308-81.

**3.4 BACKFILL**

- A. After the concrete has set sufficiently, the spaces in front and back of the curb and gutter or sidewalk shall be refilled to the required elevation with suitable material, which shall be compacted until firm and solid and neatly graded.

**3.5 CLEANING AND ADJUSTING**

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

**END OF SECTION 32 16 13**

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**SECTION 32 17 23 - PAVEMENT MARKINGS**

**PART 1 - GENERAL**

1.1 SECTION INCLUDES

- A. Preparation and application of painted pavement markings.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Contract Drawings and Documents

1.3 REFERENCE STANDARDS

- A. Connecticut Department of Transportation Standard Specifications, latest edition.
- B. Manual on Uniform Traffic Control Devices, latest edition.
- C. City of New Britain requirements

1.4 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. Paint shall be non-bleeding, quick-drying, alkyd petroleum base paint suitable for traffic-bearing surface and shall be mixed in accordance with manufacturer's instructions before application.
- B. Provide ready-mixed one component waterborne traffic line paint. Materials shall comply with CTDOT Form 817 section 12.09 Painted Pavement Markings.

**PART 3 - EXECUTION**

3.1 PREPARATION

- A. Sweep and clean surface to eliminate loose material and dust.
- B. Where existing pavement markings are indicated on Contract Documents to be removed or would interfere with adhesion of new paint, motorized abrasive device shall be used to remove markings. Equipment employed shall not damage existing paving or create surface hazardous to vehicle or pedestrian traffic. Within public rights-of-way, method of marking removal shall be approved by appropriate governing authority.

3.2 APPLICATION

- A. Apply two (2) coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum of 100 sq. ft per gal. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.
- B. Install preformed pavement markings according to manufacturers recommended procedures for the specified material.
- C. Following items shall be painted with colors noted below:
  - 1. Pedestrian Crosswalks and stop bars: White
  - 2. Bicycle Lane: white or as shown on Contract Documents
  - 3. Parking Stall Striping: White or as shown on Contract Documents.
- D. The Minimum Required total Dry Film Thickness (DFT): The DFT shall be the minimum required dry film thickness as measured in mils. or as required by sections 2.1 of this specification as well as part of the referenced standard in section 1.2 of the same.



- E. System Coverage Requirements:
1. 1st Coat - 3.0 mils DFT
  2. 2nd Coat - 6.0 mils DFT

**END OF SECTION 32 17 23**

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK**

- A. Work consists of stripping and stockpiling of existing on-site topsoil and/or furnishing, placing and shaping topsoil in areas shown on the plans.

**1.3 RELATED WORK**

- A. Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
1. Section 312200 – Earth Moving.
  2. Section 329200 - Seeding.
  3. Section 329300 - Trees, Plants and Ground Cover.

**1.4 SUBMITTALS**

- A. The Contractor will submit the following samples, certifications or test results prior to use on the project. Cost of all tests will be the Contractor's responsibility. Contractor must submit test results for on-site existing topsoil and any new topsoil delivered to the site.
1. Soil amendment requirements as determined by an approved testing laboratory for existing topsoil and each source of borrow topsoil.
  2. pH of soil by an approved testing laboratory
  3. Organic content of soil by an approved testing laboratory.
  4. Mechanical analysis by an approved testing laboratory for topsoil. Analysis will include sand, silt, and clay and a 200-sieve hydrometer wash as per ASTM D 422 to isolate specific percentages of silt and clay.

**PART 2 - PRODUCTS**

**2.1 TOPSOIL**

- A. The term topsoil used herein will mean that portion of the soil defined technically as the "A" horizon by the Soil Science Society of America. It will contain 5 percent organic matter as determined by loss-on-ignition of oven-dried samples drawn by the approved testing laboratory.
- B. The following textural classes, as determined on the basis of material passing the 20-mesh sieve and subjected to partial mechanical analysis, will be acceptable:
1. Loamy sand, with not more than 80 percent sand
  2. Sandy loam
  3. Loam
  4. Sandy clay loam, with not more than 30 percent clay
  5. Silt loam, with not more than 60 percent silt.
- C. Topsoil is to be natural, fertile soil capable of growing viable plant growth, uniform in composition without subsoil, stones 1-1/4 inch or greater in overall dimensions, lumps, live plants, roots or other extraneous material. Topsoil will contain no less than 5% organic matter. Topsoil will be obtained from local sources with similar soil characteristics as onsite topsoil. Topsoil will be delivered in such a manner as not to cause damage to the site and/or buildings. Any necessary repair will be the responsibility of the contractor, at no additional cost to the owner. The topsoil will also be free from any material that will prevent suitable plant growth.
- D. The Contractor will notify the Landscape Architect of the location from which he proposes to furnish topsoil to the project at least 15 calendar days prior to delivery, if he needs additional topsoil.

- E. The topsoil and its source will be inspected and approved by the Landscape Architect before the material is delivered to the project. Any material delivered to the project which does not meet specifications, or which has become mixed with undue amounts of subsoil during any operation at the source or during placing or spreading, will be rejected and will be replaced by the Contractor with acceptable material at no extra cost to the Owner.

## 2.2 PLANTING SOIL

- A. Soil material to be used for plant pit backfill will meet the requirements of the above, with the exception that it may also contain soil material that originates from the "A" or "B" horizons of the soil profile. The acceptable textural classes for planting soil will be:
1. Loamy sand, with not more than 80 percent sand.
  2. Sandy loam.
  3. Loam.
  4. Silt loam, with not more than 60 percent silt.
  5. Clay loam, with not more than 30 percent clay.
  6. Sandy clay loam, with not more than 30 percent clay.
- B. Planting soil will be made loose and friable, will be free from refuse, stumps, roots, brush, weeds, rocks and stones 1-1/4 inches in overall dimensions. The planting soil will also be free from any material that will prevent the proper installation of the plant material or prevent the growth of plants.
- C. pH of planting soil for trees, shrubs and perennials will be adjusted by contractor to meet the requirements as shown on the Site Soil plan and these specifications.
1. For ericaceous plants and broad-leaved evergreens requiring an acid soil:
    - a. Planting soil will have a true pH of 4.5 to 5.5. If it has not, it will be amended by the contractor at his own expense to the proper pH range. To raise pH add oyster shell lime at rate per manufacturer's recommendations. To lower pH add aluminum sulfate at rate per manufacturer's recommendations.
  2. For non-acid-loving plants requiring a basic soil:
    - a. Planting soil will have a true pH value of 6.5 to 7.0. If it has not, it will be amended by the contractor at his own expense to the proper pH range. To raise pH add oyster shell lime at rate per manufacturer's recommendations. To lower pH add aluminum sulfate at rate per manufacturer's recommendations.
- The above amendments will be considered as a minimum amendment requirement for the project. Additional amendments may be required as determined by the soil test results. Landscape Architect will make final determination for need of additional amendments prior to placement of planting soil.
- D. pH of planting soil for lawn areas will be adjusted by contractor to be 6.5. To raise pH add oyster shell lime at rate per manufacturer's recommendations. To lower pH add aluminum at rate per manufacturer's recommendations. The above amendments will be considered as a minimum amendment requirement for the project. Additional amendments may be required as determined by the soil test results. Landscape Architect will make final determination for need of additional amendments prior to placement of planting soil.
- E. The Landscape Architect reserves the right to draw such samples and to perform such tests as they deem necessary to assure that these specifications are met.

## PART 3 - EXECUTION

### 3.1 STRIPPING OF TOPSOIL

- A. Strip all topsoil of acceptable quality from within the contract limit line where construction work is to occur. Special attention will be taken where stripping operations meet areas of existing trees to avoid damage to tree root systems. Areas to be regraded or resurfaced will be stripped of topsoil without the admixture of subsoil; protect the stockpile against loss and the admixture of debris. Remove from the topsoil when stripped all sticks, stone and refuse four inches or more in any dimension. Do not strip topsoil in a muddy or frozen condition.

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**3.2 PLACEMENT OF TOPSOIL**

- A.** Topsoil will not be removed from the property until construction is completed, and will be stored in neat soil banks for use as required under this Section. Contractor to install silt fence or hay bales around perimeter of all topsoil stockpiles.
- B.** The areas on which topsoil is to be placed will be graded to a reasonably true surface. Prior to placing topsoil, contractor will rake subsoil of all debris and scarify to a depth of 3". In areas of compaction contractor will use a rototiller to loosen the subsoil. Topsoil will then be spread and shaped to the lines and grades shown on the plans, or as directed by the Landscape Architect. The topsoil is to be placed 6 inches deep in lawn areas and 12 inches deep in plant beds after settlement of material has taken place unless otherwise shown on plans. All stones, roots, debris, sod, weeds and other undesirable material will be removed. After shaping and grading, all trucks and other equipment will be excluded from the topsoiled area to prevent excessive compaction. The Contractor will perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.
- C.** During hauling and spreading operations, the Contractor will immediately remove any material dumped or spilled on pavement areas.
- D.** It will be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition until the completion of the construction work.

**END OF SECTION 32 91 13**

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**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including the General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK**

- A. The work included in this item shall consist of providing an accepted uniform stand of established perennial turf grasses and native seed mixes by furnishing and placing fertilizer, seed and mulch on all areas to be treated as shown on the plans.

**1.3 RELATED WORK**

- A. Other specification sections which directly relate to the work of this section include, but are not limited to, the following
1. Section 329113 - Topsoiling.

**1.4 SUBMITTALS**

- A. The Contractor shall submit the following samples, certifications or test results prior to use on the project.
1. Fertilizer: Form of Affidavit (On Official Stationery of Supplier) certifying compliance with State and Federal regulations and Standards of the Association of Official Agricultural Chemists.
  2. Seed: Form of Affidavit (On Official Stationery of Supplier) certifying compliance with State and Federal regulations and testing provisions of the Association of Official Seed Analysts for each shipment of seed for this project.
  3. Manufacturer certification of proposed seed mix verifying compliance with seed mixtures below.
  4. Product data and manufacturer's or vendor's certified analysis for soil amendments, fertilizer materials, and weed control plus fertilizer.

**PART 2 - PRODUCTS**

- 2.1 All materials furnished in accordance with the requirements of this specification shall be delivered, where applicable, in sealed, unbroken packages bearing the brand and maker's name and shall be stored on platforms and be properly covered to protect them from the weather and damage.

- A. Limestone (calcium carbonate) containing minimum of 80% calcium and magnesium carbonates, Certified analysis 100% to pass #10 mesh sieve, 90% to pass #100 mesh sieve, 50% to pass #200 sieve.
- B. Organic Fertilizer: Commercial composite fertilizer, uniform in composition, dry and free flowing. It shall bear the manufacturer's guaranteed statement of analysis which shall be 5-10-5 for original fertilization and 10-6-4 for refertilization with 50% organic nitrogen. Any fertilizer which becomes caked or otherwise damaged, rendering it unsuitable for use, will not be accepted.
- C. Seed of the previous year's crop. Weed seed content not to exceed 1% by weight. Seed shall conform to the following requirements:

**1. Seed Mixture 'A' - Sun Lawn**

Sun Lawn Mixture shall meet the following:

- Chewings Fescue – 35%
- Hard Fescue – 30%
- Colonial Bentgrass – 5%
- Birdsfoot Trefoil – 10%
- Perennial Rye Grass – 20%

**2. Seed Mixture 'B' – Shade Lawn**

Shade Lawn Mixture shall meet the following:

- Golconda Tall Fescue – 20%
- Toltec Tall Fescue – 20%
- Frontier Perennial Rye Grass – 20%
- Hood Chewings Fescue – 15%
- Eugene Creeping Red Fescue – 15%
- Deep Blue Kentucky Bluegrass – 10%

Mixtures will be sown as per manufacturer's recommendations.

- D. Organic weed control plus fertilizer – a pre-emergent granular formula of corn gluten plus organic fertilizer.
- E. Water: Potable.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Contractor shall verify that prepared soil base is ready to receive the work of this Section.
- B. Beginning of installation means acceptance of existing site conditions.

#### 3.2 PREPARATION OF TOPSOIL OR SURFACE

- A. Harrow or rake the topsoil or surface to a depth of 3 inches.
- B. Remove debris and stones having any dimension greater than 1-1/4 inches.
- C. For seeded lawn apply limestone at rates determined by testing and thoroughly incorporate into the upper 1 inch of topsoil.
- D. For seeded lawn apply organic fertilizer at rates determined by testing and thoroughly incorporate into the upper 1 inch of topsoil.
- E. Rake finish surface smooth.

#### 3.3 RATE OF APPLICATION

<u>Materials</u>	<u>per 1,000 sf</u>
Limestone	as determined by testing
Fertilizer	as determined by testing
Seed	As per manufacturer's recommendations
Refertilizing	20 pounds
Straw mulch	4-1/2 tons per acre

#### 3.4 SEEDING

- A. Sow seed, applying half the quantity in one direction and the remaining quantity at right angles to it.
- B. Do not sow seed on a windy day or when the ground is frozen, wet or otherwise non-tillable.
- C. Cover seed with a thin layer of topsoil by raking or dragging. Cover with straw mulch, loosely spread to a uniform depth.
- D. Under this specification, hydro-seeding is not acceptable unless by written approval of the Landscape Architect.

#### 3.5 SEEDING SEASON

- A. The calendar dates for seeding shall be:
  1. Spring - March 15 to June 15
  2. Fall - August 15 to October 15
- B. All disturbed soil areas shall be treated during the seeding season.
  1. Areas at final grade. Permanent seeding will be accomplished.
  2. Areas not to be brought to final grade for an extended period of time during 'in season' periods shall be temporarily seeded with perennial rye-grass (*Lolium perenne*) at the rate of no less than 175 lbs. of seed mixture/acre. Refer to sub-article 9.50.03-3 of the State Specifications for additional requirements.

3. During "out-of-season" periods, unseeded areas shall be treated in accordance with Section 2.10.01 - 2.10.03, Water Pollution Control, of the State Specifications. "Out-of-season" treatments shall be removed prior to seeding unless otherwise directed by the Landscape Architect.

### 3.6 MAINTENANCE

- A. Maintain a moist seed bed at all times. Water seed bed so that the topsoil is wet to a depth of 2 inches. Apply one complete coverage to the seeded area in an 8-hour period.
- B. Protect the seed bed with temporary fencing that will keep all traffic off the area until a satisfactory stand of grass has been established as specified in 3.7.C of this section.
- C. After the grass has appeared, reseed all areas which have failed to show a uniform stand of grass.
- D. Contractor to maintain all seeded areas until acceptance by Landscape Architect. Maintenance includes any or all of the following, whichever are necessary:
  1. Regrading
  2. Refertilizing
  3. Reseeding
  4. Watering
  5. Weeding
  6. Rolling
- E. Mowing: When average height of grass becomes 3-1/2 inches, mow to the height of 2-1/2 inches. Remove heavy clippings.
- F. Contractor shall perform a second fertilization either:
  1. The following Spring after a Fall seeding, or
  2. in the Fall after a Spring seeding.

Notify the Landscape Architect in writing when this is to be done.

### 3.7 INSPECTION AND ACCEPTANCE OF SEEDED AREAS

- A. Submit written notice requesting inspection by the Landscape Architect at least 10 days prior to the anticipated date.
- B. No seeded areas will be inspected for acceptance:
  1. Prior to 60 days from date of seeding.
  2. Prior to the completion of two mowings by the Contractor.
- C. A satisfactory stand of grass or forbes which is acceptable is defined as consisting of a uniform stand of at least 60% established permanent grass or forbes species. An acceptable stand of grass or forbes will be determined by the Landscape Architect.
- D. Contractor will apply organic weed control plus fertilizer according to manufacturer's specifications on all turf areas the following Spring after full germination and lawn acceptance.

**END OF SECTION 32 92 00**



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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK**

- A. The work under these items will consist of furnishing, planting and mulching trees, shrubs, ground cover and perennial plants of the type and size indicated on the plans. It will also include all incidental operations, such as plant pit excavation, fine grading and preparing all groundcover/perennial beds, mulching, protection, maintenance and replacement of dead and unsatisfactory plants or unsatisfactory materials before final acceptance of the contract.

**1.3 RELATED WORK**

- A. Other specification sections which directly relate to the work of this section include, but are not limited to, the following
1. Section 329113 – Topsoiling
  2. Section 329200 - Seeding

**1.4 SUBMITTALS**

- A. The Contractor will submit the following samples, certifications or test results prior to use on the project.
1. Submit certificates of inspection by governmental authorities that each shipment is free from disease and infestation.
  2. Variety certification for all plant material.
  3. Product Data and manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials, anti-desiccant, preemergent herbicide, synthetic polymer.
  4. Product data for mycorrhiza spores.
  5. Sample of mulch
  6. Planting Schedule: Submit proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site.
  7. Maintenance Instructions: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work. Submit to Landscape Architect for review, prior to expiration of required maintenance period(s).

**1.5 QUALITY ASSURANCE**

- A. Subcontract landscape work to a single firm specializing in landscape work.
- B. Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
- C. Do not make substitutions. If specified landscape material is not obtainable, submit to the Landscape Architect written proof of non-availability and proposal for use of equivalent material. When authorized in writing, adjustment of contract amount will be made.
- D. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

- E. Trees and Shrubs: Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock". Trees, shrubs and plants of larger size may be used if acceptable to Landscape Architect, and if sizes of roots or balls are increased proportionately. Provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
- F. Label at least one tree and one shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.
- G. Inspection: The Landscape Architect will select and tag trees and shrubs at the source before delivery to the site. The Landscape Architect retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees and shrubs immediately from project site.

## **PART 2 - PRODUCTS**

### **2.1 PLANT MATERIAL**

- A. Plant names will agree with the nomenclature of "Standardized Plant Names" as adopted by the American Joint Committee on Horticulture Nomenclature, 1942 Edition. Size and grading standards will conform to those of the American Association of Nurserymen unless otherwise specified. No substitution will be permitted except by written permission of the Landscape Architect.
- B. The quality of all plants will be typical of their species or variety. They will have normal well-developed branches and vigorous root systems. They will be free of fibrous defects, disfiguring knots, sunscald injuries, abrasions of the bark, plant disease, insect eggs, boxes and all forms of infestations. All plants will be nursery-grown unless otherwise stated. They will have been growing under the same climatic conditions as the location of this project for at least two years prior to date of planting on this project. Plants held in cold storage will be rejected.
- C. For measurement purposes, a plant will be dimensioned as it stands in its natural position. Trees will be calipered 6 inches above ground. Stock furnished will be a fair average of the minimum and maximum sizes specified. Large plants cut back to sizes specified will not be accepted.
- D. Provide balled and burlapped single stem trees except where special forms are shown or listed.
- E. Provide deciduous shrubs as indicated on plant list. Container grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs where indicated on the plans subject to specified limitations for container grown stock and after approval of Landscape Architect.
- F. Provide evergreens of sizes shown or listed. Dimensions indicate minimum spread for spreading and semi-spreading type of evergreens and height for other types, such as globe, dwarf, cone, pyramidal, broad upright, and columnar. Provide normal quality evergreens with well-balanced form complying with requirements for other size relationships to the primary dimension shown. Provide balled and burlapped (B&B) evergreens. Container grown evergreens will be acceptable subject to specified limitations for container grown stock and after approval of Landscape Architect.
- G. All balled and burlapped plants must come from soil which will hold a firm ball. The latter will be wrapped with burlap, or a similar approved material, and tightly laced in such a manner as to hold the balls firm and intact. All balled and burlapped material arriving with broken or loose balls, or with manufactured balls will be rejected.

### **2.2 SOIL AMENDMENTS**

- A. Soil amendments will meet the following minimum requirements. Quantity and type of soil amendment required will be as per topsoil testing. Contractor will review topsoil test with Landscape Architect prior to adding amendments and adjust application rates as directed.
  - 1. Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10-mesh sieve and not less than 50% passes a 100-mesh sieve or approved equal.
  - 2. Peat Humus FS Q-P-166 and with texture and pH range suitable for intended use.
  - 3. Nitrogen Blood meal (13-1-0) or approved equal.

4. Phosphorous: Commercial, steamed, finely ground Bonemeal (2-14-0) or Natural rock phosphate (0-3-0).
5. Potassium
6. Manure: Well rotted, unbleached stable or cattle manure containing not more than 25% by volume of straw, sawdust or other bedding materials and containing no chemicals or ingredients harmful to plants.
7. Commercial Fertilizer: Organic fertilizer (8-3-3)
8. Compost: Composted organic matter.
9. Mycorrhiza spores.

**2.3 MATERIALS**

- A. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.
- B. Water management polymer
- C. Organic pre-emergent weed control.
- D. Mulch will be sweet peat. Shredded bark or hardwood chip mulch shall not be accepted.

**PART 3 - EXECUTION**

**3.1 PLANT MATERIALS FURNISHED AND PLACED**

- A. The Contractor will stake all plant locations in the field as per the planting plan. Contractor will obtain Landscape Architects approval for all plant locations prior to installing plants.
- B. The contractor will excavate all plant pits and will furnish, plant, maintain and replace all plant materials specified in the "Plant List" in accordance with these specifications, as shown on the drawings and as directed by the Landscape Architect.
- C. The Contractor will be liable for any damage to property caused by planting operations, and all areas disturbed by construction will be restored by the contractor to their original condition to the satisfaction of the Landscape Architect.
- D. The Contractor will ascertain exact locations of utility structures in the area of proposed landscape development prior to staking plant locations for approval. The Contractor is responsible for any damage and will replace or repair any damage at the Contractor's expense. Changes in the locations of plant material due to utility or other underground obstructions will not be cause for extra compensation.
- E. In preparing plants for moving, all precautions customary and in good practice will be taken, and workmanship that fails to meet the highest standards will be rejected. All plants will be dug to retain as many fibrous roots as possible. The size of the ball of balled and burlapped and balled and platformed plants will be at least 12 inches in diameter for every inch of the maximum caliper size specified. The ball will be a solid ball of earth securely held in place by burlap and a stout rope. Oversize, exceptionally heavy plants are acceptable if the size of ball or spread of the roots is proportionately increased. Loose, broken or fabricated balls of earth will be rejected. Balled and platformed plants will be securely tied with a stout rope to sturdy platforms equal in size to the diameter of the upper half of the ball of earth.
- F. For delivery, all plants will be packed, transported and handled with utmost care to ensure protection against injury. Each shipment will be certified by the State and Federal Authorities to be free from disease and infestation. Any inspection certificate required by law to this effect will accompany each shipment invoice or order of stock. On arrival, the certificate will be filed with the Landscape Architect. Balled and burlapped plants will be carefully set on the ground and the balls covered with moist soil. Deliver plant material after preparations for planting have been completed and plant immediately. If planting is delayed more than six hours set plant material in shade; protect from damage and keep roots moist.

- G. All plants are subject to inspection and approval at point of origin before or after award of contract. No plant material will be planted until inspected and approved. Any rejected plant material will be immediately removed from the site and replaced with plant material acceptable to the Landscape Architect at no extra cost to the Owner.

**3.2 PLANTING PROCEDURES**

- A. Planting Season: Seasons for planting, unless otherwise authorized by the Landscape Architect, will be within the following dates:

**Deciduous Material**

Spring    March 21 to June 1  
Fall        Sept. 1 to Nov. 1

**Evergreen Material**

April 1 to June 1  
Aug. 21 to Oct. 15

- B. Beds of topsoil previously spread in accordance with these specifications will be reworked until they are friable, free from mortar and debris, accurate to line and grade and otherwise suitable for planting operations. Scarify any subgrade areas to 3" depth before spreading any topsoil or planting mixture. Subgrade to be rototilled, in areas of compaction, prior to placement of topsoil.

- C. Plant bed backfill mixture for trees and shrubs will be (as a minimum)

1. 1 CY composted manure, 1 bale of peat moss, 3 CY topsoil.
2. Commercial fertilizer thoroughly mixed into plant pit backfill mix at rate recommended by manufacturer.
3. pH of plant pit backfill mixture will be adjusted by contractor to meet the requirements as shown on the site soil plan and as indicated below:
  - a. For ericaceous plants and broad-leaved evergreens requiring an acid soil:
    1. Planting pit backfill shall have a true pH of 4.5 to 5.5. If it has not, it shall be amended by the contractor at his own expense to the proper pH range by thoroughly mixing plant pit backfill mixture with Aluminum Sulfate. Incorporate sulfate at rates per manufacturer's recommendations.
  - b. For non-acid-loving plants requiring a basic soil:
    1. Planting pit backfill shall have a true pH value of 6.5 to 7.0. If it has not, it shall be amended by the contractor at his own expense to the proper pH range by mixing with oyster shell lime or approved equal. Thoroughly incorporate oyster shell lime into the plant pit backfill mix at rate as per manufacturer's recommendations.

The above amendments will be considered as a minimum amendment requirement for the project. Additional amendments may be required as determined by the soil test results.

Landscape architect will make final determination for need of additional amendments prior to placement of plant pit backfill mixture.

- D. Soil for use in lawn areas will be (as a minimum):

1. 1 cy composted manure, 1 bale of peat moss, 3 cy topsoil.
2. Commercial fertilizer. After spreading and leveling soil, till or rake fertilizer into the top 2" of soil at the rate of 40 lbs. /2,000 sf.
3. pH of lawn soil mixture will be adjusted by contractor to be 6.5 to 7.0. to raise pH add oyster shell lime at rate per manufacturer's recommendations. To lower pH add aluminum sulfate at rate of 2.5lbs./cy.

The above amendments will be considered as a minimum amendment requirement for the project. Additional amendments may be required as determined by the soil test results. Landscape architect will make final determination for need of additional amendments prior to placement of soil mix in lawn areas.

Provide mixtures as required. Bulk mix on site, no off site mixing allowed.

- E. Planting of trees and shrubs will be in pits for single plants and/or beds for groups of plants, as detailed.
- F. Plant pits will have sloping sides unless otherwise directed. Subsoil from planting excavations will be removed from the site.
- G. Plants will be planted plumb at the same level at which they have grown unless otherwise specified on the drawings. The balls of earth of balled and burlapped plants will not be loosened or otherwise damaged during planting operations. All large and fleshy roots which are bruised or broken will be pruned with a clean cut away from upper half of ball and remaining burlap adjusted to prevent formation of air pockets. Soil will be firmed at 6 inch to 8 inch intervals and thoroughly settled with water.
- H. Ground cover and perennial plants will be planted deep enough to set each individual plant at its established grade with soil well-firmed around its roots.
- I. Spread organic pre-emergent weed control in all tree and plant areas and then mulch with a 2" thick layer of mulch as specified in drawings and fertilized as directed by the Landscape Architect with commercial fertilizer and/or soil amendments. Plant areas will be cultivated and raked over, and will be left in a clean, orderly condition with willow basins or "saucers" as indicated on the detail.
- J. Fertilize each plant area or plant saucer area at a uniform rate using soil amendments required as per the topsoil test report, manufacturers recommendations and as directed by Landscape Architect.
- K. Do not prune trees at planting except for specific structural corrections.
- L. All soft wood or sucker growth and all broken, dead or badly bruised branches will be removed with clean cuts.
- M. All pruning cuts will be made with sharp tools and will be sharp and clean. Pruning cuts over 3/4 inch will be painted with approved tree surgery paint immediately after they are made.
- N. All plants will be thoroughly watered by contractor during and after planting operations and as weather conditions require for the entire maintenance period. Due care will be exercised to avoid "washing out" the mulched soil. Minimum watering is considered as one soaking per week.
- O. Spray all trees and broadleaf evergreens with one application of anti-desiccant in accordance with manufacturer's directions. Apply a protective film over all parts of branches, twigs, and foliage.
- P. Repair all lawn areas damaged or disturbed during planting operations as per section 329200.

### **3.3 MAINTENANCE**

- A. Required maintenance period begins at start of planting procedure and continues for one-year past approval and final acceptance of planting by the Landscape Architect.
- B. Maintenance Period Requirements
  1. Provide monthly inspection of all plant material. Provide a monthly evaluation report of the condition and requirements of the plants to the Owner and Landscape Architect.
  2. All planted trees, shrubs, and ground cover, and all planting areas within the limits of this contract will be maintained by the Contractor until all work under this contract is approved and accepted by the Landscape Architect. Maintenance will include watering, weeding, cultivating and pruning; removing dead material, resetting plants to proper grades in upright positions and restoring the planting saucer, repairing damage due to minor washouts and gullies and other horticultural operations necessary for the proper growth of plants and maintaining a neat appearance of all work under contract. Weeds will not be allowed to attain a growth of over 6 inches before being removed. Maintenance of planting will begin immediately after each plant is planted and continue until acceptance by Landscape Architect. If planting is done after seeding, proper protection of seeded areas will be provided and any damage resulting from planting operations will be repaired promptly at the Contractor's expense to the satisfaction of the Landscape Architect.
  3. Maintenance responsibilities beginning at acceptance of plant material and continuing for a one year period will include any spraying required from observations from monthly inspection visit, pruning, fertilizing as required, remulching, weeding, and other operations necessary to properly maintain plant viability.

4. At completion of the one-year maintenance period noted in Section 329300. 3.3.B.3, Contractor will remove and regrade all earth saucers to smooth finished grade.
5. Contractor will submit a maintenance schedule to the Owner.

**3.4 INSPECTION FOR ACCEPTANCE**

- A. Guarantee: All plants within this contract, or their subsequent replacements, will be guaranteed for a minimum of two years and will be alive and in satisfactory growth at the end of the guarantee period. Period of guarantee will begin upon final acceptance of the entire project.
- B. Replacement: At the end of the guarantee period, inspection will be made by the Landscape Architect upon written notice requesting such inspection submitted by the Contractor. Any plant required under this contract that is dead or not in satisfactory growth, as determined by the Landscape Architect, will be removed from the site. These and any plants missing will be replaced as soon as conditions permit, but during the normal planting season. All replacements will be plants of the same kind and size as specified in the plant list.
- C. Replacements will be at the Contractor's expense. A sum sufficient to cover the estimated cost of possible replacements, including materials and labor, will be retained and paid to the Contractor only after all replacements have been made and approved.

**END OF SECTION 32 93 00**

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**SECTION 33 11 16 SITE WATER****PART 1 - GENERAL**

## 1.1 SCOPE

Work under this Section shall consist of providing all labor, plant facilities, materials, and equipment necessary and required to install all proposed water facilities in accordance with the Contract Documents. This Work shall include but not be limited to:

- A. Installation of water mains consisting of pipes, valves, thrust blocks, meter pits, and all necessary and required accessory items and operations.
- B. Coordination of the connection of building service lines to the on-site water mains with the Building Contractor.
- C. Coordination with New Britain Water Department.
- D. Sterilization and testing of new water facilities.

## 1.2 RELATED DOCUMENTS

- A. Work performed under this section shall be subject to all the Contract Documents including the Drawings, the General Conditions, the Supplementary Conditions and Division 1 General Requirements.
- B. New Britain Water Department specifications, agreements and requirements.
- C. Section 31 23 33 –Trench Excavation and Backfill for Utilities

## 1.3 UTILITY CONTACTS

New Britain Water Department  
1000 Shuttle Meadow Avenue  
New Britain, CT 06052

**PART 2 - PRODUCTS**

## 2.1 MATERIALS

- A. Copper Tube: ASTM B88-61, soft annealed temper with bituminous coating, cast copper alloy flared-joint fittings, ANSI B16.26, Type K for domestic service under four (where required by local authorities in lieu of ductile iron or as shown on the Drawings).
- B. Control Valves:
  - 1. General: Provide valves and flow control devices as indicated.
  - 2. Minimum Working Pressure: 150 psi unless otherwise indicated, or required.
  - 3. Gate Valves: Standard shut-off valves with maximum working pressure cast into body, outside-screw-and-yoke type complying with AWWA C500.
  - 4. Check Valves: Gravity-operated, regular type, iron-bodied, bronze fitted with metal-to-metal rubber faced checks, complying with AWWA C506.
  - 5. Butterfly Valves: Rubber seated, equipped with gear or traveling nut actuator to minimize water hammer, complying with AWWA C504.
- C. Accessories:
  - 1. General: Provide anchorages for tees, plugs, caps, and bends. After installation, apply a full coat of asphalt or other acceptable corrosion-retarding material to surfaces of rods and clamps.
  - 2. Clamps, Straps and Washers: Steel, ANSI/ASTM A506.



3. Rods: Steel, ANSI/ASTM A575.
  4. Rod Couplings: Malleable iron, ANSI/ASTM A197.
  5. Bolts: Steel, ANSI/ASTM A307.
  6. Cast-Iron Washers: ANSI/ASTM A126, Class A.
  7. Trust Blocks: 2,500 psi concrete. Use at all changes in directions and else where as necessary.
  8. Fittings: Fitting should be short body, cast iron or ductile iron, and should conform and be installed per applicable AWWA C110/A21.10-82 or C153/A21.53-84.
  9. Water Service Identification: Plastic line marker tape, nomenclature: "Caution, Buried Water Line Below".
- D. Concrete: Concrete for valve seats shall have a minimum compressive strength of 3,000 psi in 28 days.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. The Contractor shall install all water pipe in the locations as shown on the Drawings and/or as approved by the Owner's Representative. Pipe shall be of the type and sizes specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented. Installation should conform with applicable AWWA Standards for the installation of cast iron water mains C600-64.
- B. The Contractor shall perform a fire flow test in conjunction with Aquarion prior to the start of water main installation work. The test shall comply with all Aquarion rules and regulations.

#### **3.2 EXCAVATION AND BACKFILL**

- A. The provisions of Section 31 23 33 entitled "Trench Excavation and Backfill for Site Utilities" shall govern all work under this Section.

#### **3.3 STORAGE AND HANDLING OF PIPE**

- A. All pipes shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations, subject to the approval of the Owner's Representative.

#### **3.4 DAMAGE TO PIPE**

- A. Pipe which is defective from any cause, including damage caused by handling, and determined by the Owner's Representative as unrepairable, shall be unacceptable for installation and shall be replaced at no cost to the Owner as directed by the Owner's Representative.
- B. Pipe that is damaged or disturbed through any cause prior to acceptance of the Work shall be repaired, realigned or replaced as directed by the Owner's Representative, at the Contractor's expense.

#### **3.5 PIPE INSTALLATION**

- A. Laying Pipe - Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 31 23 33 entitled "Trench Excavation and Backfill for Site Utilities". All pipe shall have a minimum cover of 4.5 feet above the top of the pipe, and must be laid in separate trenches at least ten feet from the sewer pipe. Crossing of other facilities must have 12 inch minimum clearance (18 inches minimum clearance from sanitary).

Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing in the line. No pipe is to be trimmed or chipped to fit.

No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.

- B. Full Length of Pipe - Full lengths of pipe are to be used whenever possible to minimize the amount of cutting and splicing in the field.
- C. Bedding and Backfilling - The type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements of Section 31 23 33 entitled "Trench Excavation and Backfill for Site Utilities", and as shown on the Details on the Drawings. Water services shall be placed within 12 inches of clean sand conforming to the requirements of Section 31 23 33.
- D. Protection During Construction - The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.

At all times when pipe laying is not in progress, all open ends of pipes shall be closed by temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has passed.

### 3.6 PIPE JOINTS

- A. All joints are to be made water-tight and shall be tested in accordance with the requirements of Aquarion.
- B. Pipe shall be jointed in strict accordance with the pipe manufacturer's instruction. Jointing of all pipe shall be done entirely in the trench.

### 3.7 THRUST BLOCKS

- A. Thrust blocks shall be constructed at all bends by placing a minimum of one-third cubic yard of concrete for each fitting at the undisturbed side of excavation. The thrust block construction shall be adequate to sustain the imposed load. Placement of thrust blocks shall conform to the details and schedule of the Drawings.

### 3.8 CONNECTION TO EXISTING FACILITIES

- A. General - The Contractor shall make all required connections of the proposed water lines into existing water facilities, where and as shown on the Drawings and/or as approved by the Owner's Representative. Connections shall be performed by a Contractor approved by the local utility company. The Contractor shall perform any investigation measures including, but not limited to, exploratory test pits to confirm the point of tie-in and avoidance of other utilities. All investigation measures should be performed a minimum of two weeks prior to the start of water main installation work. Notify engineer of any conflicts. The Contractor shall be responsible for relocating utilities in conflict.
- B. Compliance with Requirements of Owner of Facility - Connections into existing water facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor shall be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with the requirements of the owner of the existing facility shall be included in the Contract Sum.

### 3.9 SERVICE LINES

- A. General - The Contractor shall terminate the water laterals five feet from the building. Work shall include making the service line connections into the on-site water mains, furnishing and installing all service line pipe from the on-site water main systems to points located five feet outside of the proposed building lines and properly sealing the ends with watertight plugs. Service line extensions from these points into the building will be performed by the Building Contractor.
- B. Coordination with Building Contractor - The Contractor shall be required to coordinate his work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building. If the Building Contractor has installed his portion of the water service line, work under this Contract shall also include final connection of the water service line five feet outside the building line to the building service line at no additional cost to the Owner. The Contractor shall review the latest architectural/ mechanical plans to verify the location of the service

laterals.

- C. Connection into On-Site Water System - Water service line connections to the pipe of the on-site water mains shall be made with proper fittings supplied by the pipe manufacturer and as shown on the Drawings in a manner satisfactory to the Owner's Representative.

#### 3.10 STERILIZING

- A. All new water lines shall be flushed, sterilized and inspected prior to being put into service and the final connection(s) made to the existing system. Contractor shall sterilize lines in accordance with AWWA C601 or the local utility requirements, whichever is more restrictive.

#### 3.11 TESTING

- A. The Contractor shall coordinate and perform all required in connection with the tests. Hydrostatic and leakage tests shall be performed in accordance with the latest edition of AWWA C600 or the local utility requirements, whichever is more restrictive.

#### 3.12 FINAL INSPECTION

- A. Upon completion of the Work and before final acceptance by the Owner, the entire water system may be subjected to a final inspection in the presence of the Site Engineer and/or Owner's Representative at the Owner's discretion. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, leakage tests and workmanship have been met.

**END OF SECTION 33 11 16**

**SECTION 33 30 00 SITE SANITARY SEWERS**

**PART 1 - GENERAL**

1.1 SCOPE OF WORK

Work under this section of the specifications shall consist of providing all labor, plant facilities, materials and equipment necessary to install all of the sanitary sewer facilities. This work shall include but not be limited to:

- A. Installation of sanitary sewers consisting of pipe, cleanouts, laterals, wye connections, and all necessary and required accessory items and operations as shown on the Details and Drawings.
- B. Furnish factory-fabricated fittings of the same type and class of material as the pipe, or of material having equal or superior physical and chemical properties.
- C. All necessary coordination with the Water Pollution Control Authority (WPCA).
- D. Testing of sanitary sewer system
- E. Abandonment and removal of existing sanitary sewer pipes and manholes.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Work performed under this section shall be subject to all the Contract Documents including the Drawings, the General Conditions, the Supplementary Conditions and Division 1 General Requirements.
- B. Section 31 23 33 –Trench Excavation and Backfill

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. The Contractor shall install materials based on this specification
- B. Polyvinyl Chloride (PVC) Pipe: ASTM D3034-93 for pipe and fittings, minimum wall thickness SDR-35. Provide minimum three feet of pipe cover in the pavement area.
- C. Cleanouts: Iron body type with extra heavy bronze plugs. Cover shall consist of Neenah Foundry Company Pattern No. R-1914 with locking cover, or approved equal.
- D. Pipe joint: Rubber gasketed tongue-and-groove joints in all pipes.

**PART 3 - EXECUTION**

3.1 GENERAL

- A. The Contractor shall install all sanitary sewer structures and pipe in the locations as shown on the Drawings and/or as approved by the Owner's Representative. Pipe shall be of the type and sizes specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.

3.2 EXCAVATION AND BACKFILL

- A. The provisions of Section 31 23 33 entitled "Trench Excavation and Backfill for Utilities" shall govern all Work under this Section.

3.3 STORAGE AND HANDLING OF PIPE

- A. All pipe shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations, subject to the approval of the Owner's Representative.

3.4 DAMAGE TO PIPE

- A. Pipe which is defective from any cause, including damage caused by handling, and determined by the Owner's Representative as unrepairable, shall be unacceptable for installation and shall be replaced at no cost to the Owner as directed by the Owner's Representative. Damaged pipe shall be immediately marked with white paint and separated from usable pipe on site.

Pipe that is damaged or disturbed through any cause prior to acceptance of the Work shall be repaired, realigned or replaced as directed by the Owner's Representative, at the Contractor's expense.

3.5 PIPE INSTALLATION

- A. Laying Pipe - Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 31 23 33 entitled "Trench Excavation and Backfill for Utilities". Pipe will be laid with bells upgrade.

Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing in the line. Extreme care must be taken to keep the bells of the pipe free from dirt and rocks so that joints may be properly assembled without over stressing the bells. No pipe is to be trimmed or chipped to fit.

No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.

- B. Full Lengths of Pipe - Only full lengths of pipe are to be used in the installation except that partial lengths of pipe may be used at the entrance to structures where necessary to obtain a proper connection to the structure.
- C. Pipe Entrances to Structures - All pipe entering structures shall be cut flush with the inside face of the structure, and the cut ends of the pipe surface of the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation.
- D. Bedding and Backfilling - The type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements Section 31 23 33 entitled "Trench Excavation and Backfill for Utilities" and as shown on the Details of the Drawings.
- E. Protection During Construction - The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.

At all times when pipe laying is not in progress, all open ends of pipes shall be closed by temporary water tight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has passed.

- F. Tolerance - Pipe shall be laid accurately to the line and grade as shown on the Drawings and/or as approved by the Owner's Representative. Allowable tolerances shall be 1/4 inch in grade and 1/2 inch in line in any section of pipe between manholes. No adverse grades shall be allowed. Deviations from these tolerances shall be grounds for rejection of the line of pipe by the Owner's Representative. Any line which has been rejected shall be rebuilt to the correct line and grade by the Contractor at his own expense.
- G. Do not lay the sanitary sewer line closer horizontally than ten feet to a water main or service line. Where sanitary sewer lines pass above water lines, encase the sewer in six inches of concrete for a distance of ten feet on each side of the crossing or substitute rubber-gasketed pressure pipe for the pipe being used for the same distance if approved by the appropriate sewerage authority.

3.6 PIPE JOINTS

- A. All joints are to be made watertight in accordance with the requirements specified herein.
- B. Pipe shall be jointed in strict accordance with the pipe manufacturer's instructions. Jointing of all pipe shall be done entirely in the trench.

- C. Where sanitary sewer lines pass below water lines, lay pipe so that no joint in the sewer line will be closer than 3 feet horizontally to the water line.
- D. Where sanitary sewer lines pass less than 18 inches below the water line, provide concrete encasement. The length of encasement is to be increased to the nearest joint beyond the specified horizontal offset distance.
- E. Make joints between ductile-iron pipe and other types of pipe with standard manufactured ductile-iron adapters and fittings or as directed by the local sewerage authority. Install ductile-iron piping and fittings in accordance with the recommendations of the pipe manufacturer.

3.7 SERVICE LINES

- A. General - The Contractor shall terminate sanitary laterals five feet from the building.
- B. Coordination with Building Contractor - The Contractor will be required to coordinate his work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building. If the Building Contractor has installed his portion of the sanitary sewer service line, work under this contract shall also include final connection of the sanitary sewer service line five feet outside the building line to the building service line at no additional cost to the Owner. The Contractor shall consult the latest architectural/mechanical drawings to confirm lateral locations.

3.8 INSPECTION AND TESTING

- A. General - The Contractor shall test the completed sewer laterals for leakage by low-pressure air test, infiltration and exfiltration tests as specified herein and any other testing required by the local sewer authority. The Contractor shall furnish all necessary equipment, materials and labor for performing the tests as specified. The Contractor shall notify the Owner's Representative and the sewage authority at least 48 hours prior to the start of testing. Sections of pipe tested for infiltration and exfiltration prior to completion of the project shall be subject to additional leakage tests, if warranted in the opinion of the Owner's Representative, and/or the sewage authority prior to acceptance of the project.
- B. Infiltration and Exfiltration Testing - The test length intervals for either type of leakage test shall be approved by the Owner's Representative and the sewage authority, but in no event shall they exceed 1000 feet. In the case of sewers laid on steep grades, the length of line to be tested by exfiltration at any one time may be limited by the maximum allowable internal pressure on the pipe and joints at the lower end of the line.

The test period, wherein the measurements are taken shall not be less than four hours in either type of test.

Depending on field conditions, the following test for leakage shall be employed:

1. Infiltration Test - The test may be used only when groundwater levels are at least four feet above the highest point of the crown of the sewer being tested and after the trench has been backfilled and compacted. The groundwater leakage into the pipe will be measured near the lower end of the section of sewer under test.
2. Exfiltration Test - This test consists of filling the pipe with water to provide a head of at least five feet above the top of the pipe or five feet above groundwater, whichever is higher, at the highest point of the pipe line under test, and measuring the loss of water from the line by the amount which must be added to maintain the original level. In this test, the line must remain filled with water for at least 24 hours prior to the taking of measurements. Exfiltration shall be measured by the drop of water level in a closed-end standpipe or in one of the sewer manholes available for convenient measuring.  
  
When a standpipe and plug arrangement is used in the upper manhole of a line under test, there must be some positive method of releasing entrapped air in the sewer prior to taking measurements.
3. Leakage Requirements - The total leakage of any section tested shall not exceed the rate of 50 gallons per day per mile per inch of nominal pipe diameter. For purposes of determining the maximum allowable leakage, manholes shall be considered as sections of 48 inch diameter pipe, five feet long, and the equivalent leakage allowance shall be

2.25 gallons per manhole per 24 hours.

- C. Low Pressure Air Testing - The sewer mains and/or laterals shall be tested for leakage by the use of low-pressure air as specified hereinafter or by the local sewage authority and as approved by the Owner's Representative. The test length shall not exceed one interval of pipe between two manholes. Air test procedures may be dangerous and the Contractor shall take all necessary precautions to prevent blowouts.

The proper procedure for air testing of sanitary sewers shall be as described in ASTM C-828, latest edition, entitled "Recommended Practice for Low-Pressure Air Test of Vitrified Clay Pipe Lines (4-12 inches)". Although the title specifies vitrified clay pipe, the same procedure may be used for any other pipe material.

It is important that test plugs be properly installed to prevent blowouts. It is also important to maintain pressure relief devices to prevent system over pressurization.

- D. Correction of Defective Work - If leakage exceeds the specified amount, the Contractor shall, at his own expense, make the necessary repairs or replacements required to permanently reduce the leakage to within the specified limit, and the tests shall be repeated until the leakage requirement is met.

Any defects found in the system are to be repaired at the expense of the Contractor so as to conform strictly to the Specifications and to the satisfaction of the Owner's Representative. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, and sanitary sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance by the Owner.

- E. Compliance with Agency Requirements - In the event of conflict between the leakage test requirements specified herein with the leakage test requirements of agencies having jurisdiction over all or any portion of the sanitary sewers installed under this Contract, the more restrictive requirements shall govern.

### 3.9 CLEANING AND REPAIR

- A. The Contractor will be required to clean the entire sanitary sewer system of all debris and obstructions. This shall include, but not be limited to removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing sanitary sewers or streams; all debris shall be removed from the system.

After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be promptly performed by the Contractor.

All work of cleaning and repair as specified herein shall be performed at the Contractor's expense and to the complete satisfaction of the Owner's Representative.

### 3.10 FINAL INSPECTION

- A. Upon completion of the Work and before final acceptance by the Owner, the entire sanitary sewer system shall be subjected to a final inspection in the presence of the Site Engineer and/or Owner's Representative and local sewerage authority. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, leakage tests and workmanship have been met.

**END OF SECTION 33 30 00**

**SECTION 33 41 00 STORM SEWER SYSTEMS**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Work under this section shall consist of providing all labor, plant facilities, materials, tools, equipment, shop drawings and supervision necessary and required to install all of the storm drainage facilities as specified in accordance with the Contract Documents. This work shall include but not be limited to:
  - 1. Installation of the drainage system consisting of area/yard drains, pipes, structures and all necessary and required accessory items and operations.
  - 2. Installation of drainage facilities within the public Right-of-Way and/or easements, including connection to existing drainage facilities.

**1.2 RELATED SECTIONS AND DOCUMENTS**

- A. Section 31 23 33 - Trench Excavation and Backfill for Utilities
- B. Section 31 25 00 - Soil Erosion and Sediment Control
- C. Local governing authority and code requirements.
- D. All necessary construction permits.
- E. Contract Documents
- F. City of New Britain standard requirements

**1.3 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM) latest edition.
  - 1. A706 Type 1R
  - 2. C14 Concrete Sewer, Storm Drain, and Culvert Pipe.
  - 3. C55 Concrete Building Brick.
  - 4. C76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
  - 5. C443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
  - 6. C478 Precast Reinforced Concrete Manhole Sections.
  - 7. C923 Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.
  - 8. D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
  - 9. D2922 Test Methods for Density of Soil and Soil - Aggregate in Place by Nuclear Methods (Shallow Depth).
  - 10. D3017 Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- B. American Association of State Highway and Transportation Officials (AASHTO) - latest edition
- C. International Masonry Industry All-Weather Council (IMIAC): Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

**1.4 QUALITY ASSURANCE**

- A. An Engineer, selected and paid by the Owner (herein referenced to as "Owner's Engineer"), may be retained to perform construction inspection on-site based on measurement, visual observation, and judgment.
- B. Visual field confirmation may be performed by the Owner's Engineer as part of the construction testing requirements.



- C. All costs related to reinspection due to failures shall be paid for by the Contractor at no additional expense to Owner. The Owner reserves the right to direct any inspection that is deemed necessary. Contractor shall provide free access to site for inspection activities.
- 1.5 SUBMITTALS
- A. Product Data: Provide manufacturer's certificate for castings, pipe and accessories to certify that products meet or exceed specified requirements.
  - B. Submit shop drawings of the precast structures to the Owner's Engineer for review prior to fabrication. Shop drawings shall include dimensions, reinforcing, joint treatment, frame, cover and/or grate, invert elevations and invert locations.
- 1.6 PROJECT RECORD DOCUMENTS
- A. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
  - B. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.
- 1.7 COORDINATION
- A. Coordinate the Work with termination of storm sewer connection outside building including connection to existing storm sewer system.

## PART 2 - PRODUCTS

### 2.1 SEWER PIPE MATERIALS AND ACCESSORIES

- A. Reinforced Concrete Pipe (RCP): Straight and flared end sections complying with requirements of ASTM C 76, Class III unless another class type is indicated on the Contract Documents, installed with flexible plastic (Bitumen) gaskets at all joints. Gaskets shall comply with AASHTO M-198 75I, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.
- B. Corrugated High Density Polyethylene Pipe (HDPE) Smooth Interior: Only permitted when specifically indicated on Drawings and shall conform with AASHTO Designation M294 and M252. Pipe must be installed in accordance with pipe manufacturers installation Guidelines for Culvert Storm Drainage Applications. Acceptable manufacturers: Advanced Drainage Systems, Inc. "ADS N-12" and HANCOR, Inc. "Hi-Q" or approved equal.
- C. Polyvinyl Chloride Pipe (PVC)
  - 1. On-site pipe and fittings shall comply with ASTM D 3034, rated SDR 35 unless otherwise specified on the Contract Documents or required by the local utility. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D 3034 classification.
  - 2. Pipe joints shall be integrally molded bell ends per ASTM D 3034, Table 2, with factory supplied elastomeric gaskets and lubricant.

### 2.2 INLETS, MANHOLES AND COMPONENTS

- A. General: All drain inlets shall be built in accordance with, and in the locations shown on the Contract Documents. All structures will require shop drawings approved by the Owner's Engineer and City Engineer.
- B. No concrete or masonry shall be placed when the temperature is below 40 degrees Fahrenheit, or when indications are for lower temperatures within 24 hours, unless protection of concrete and masonry is approved by the Owner's Engineer. Damage to the structure because of freezing shall be corrected by the Contractor at his own expense, to the satisfaction of the Owner's Engineer.
- C. Drain inlets shall be constructed as soon as the pipe laying reaches the location of the structures. Should the Contractor continue his pipe laying without making provisions for completion of the structures, the Owner's Engineer shall have the authority to stop the pipe laying operations until the structure is completed.
- D. Any structure which is mislocated or oriented improperly shall be removed and re-built in its proper location, alignment and orientation at the Contractor's expense.

- E. Pour-in-place or Precast Inlet Structures (Control Structures): AASHTO M199-93/ASTM C478-90b rated for H2O loading, with minimum concrete strength of 3,000 psi. Inlet size shall be selected to accommodate the inflow and outflow pipes.
1. Barrel: Reinforced precast concrete in accordance with ASTM C478 with gaskets in accordance with ASTM C923 & C361
    - a. Construct precast concrete sections as required by Contract Documents to size, shape, and depth indicated.
  2. Mortar and Grout: Mortar for finishing and sealing shall be Class "C". Honeycombing less than two (2) inches deep shall be repaired using Class "D" mortar.
  3. Brick Transition Reinforcement: Formed steel 8-gage wire with galvanized finish.
  4. Foundations: All foundations shall rest on firm soil of uniform bearing and stone subbase as shown on Contract Documents.
  5. Frames, Cover, and Gratings: Frames, Covers and/or gratings for drain inlets shall be of the type and size indicated on the Contract Documents. Frames shall be well bedded in mortar and shall be set accurately to the correct alignment and grade.
  6. Precast Structures: Precast structures shall be installed only after shop drawings have been approved by Owner's Engineer and shall meet the requirements of ASTM C478.
  7. Grout around pipes which protrude through the walls of the structure and on all joints shall contain "Antihydro", or other approved additive to insure water tightness. Cement grout shall contain two parts cement to one part sand and additive in accordance with manufacturer's recommendations. Mortar shall be applied to the bottom 1/3 of the opening before the pipe is inserted.
  8. The top grade of the precast concrete corbel section shall be set sufficiently below finished grade to permit a maximum of seven (7) and a minimum of two (2) courses of 8-inch brick to be used as risers to adjust the grade of the casting. Manhole frames shall be set on a grout pad as specified herein above.
  9. Brick shall be new units conforming to AASHTO Designation M-91, latest revision, Grade MS.
  10. Mortar shall conform to ASTM C270, Type M.
  11. Pipe joints for rigid pipes shall be made with mortar, grout, gaskets, or as recommended by the pipe manufacturer.
  12. Pipe constructed within the Right-of-Way shall be manufactured and installed in accordance with all applicable Standard Specifications and the Contract Documents.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Contract Documents.

#### **3.2 PREPARATION**

- A. Hand trim excavations to required elevations. Correct over excavation with fine aggregate.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.
- C. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.

#### **3.3 GENERAL**

- A. The Contractor shall install all drainage structures and pipe in the locations shown on the Contract Documents and/or as approved by the Owner's Engineer. Pipe shall be of the type and sizes specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.

- B. Excavation and Backfill shall be in accordance with Section 31 23 33 of these specifications.
- C. Storage and Handling of Pipe - All pipe shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations.
- D. Damage to Pipe - Pipe which is defective from any cause, including damage caused by handling, and determined by the Owner's Engineer as not repairable, shall be unacceptable for installation and shall be replaced at no cost to the Owner as directed by the Owner's Engineer.
- E. Pipe that is damaged or disturbed through any cause prior to acceptance of the Work, shall be repaired, realigned or replaced as directed by the Owner's Engineer, at the Contractor's expense.

3.4 BEDDING

- A. Excavate pipe trench and place bedding material in accordance with Section 31 23 33 for work of this Section.

3.5 INSTALLATION - PIPE

- A. Laying Pipe: Each length of pipe shall be laid with firm, full and even bearing throughout the entire length, in a trench prepared and maintained in accordance with Section 31 23 33 of these Specifications and Contract Documents. Pipe shall be laid upgrade unless otherwise approved by the Owner's Engineer.
- B. No lift holes will be permitted in pipes 24-inches in diameter and smaller.
- C. Bell and spigot pipe shall be laid with the bell end upgrade. The pipe shall be joined so that there will be uniform space around the pipe. Trimming of the pipe shall not be allowed.
- D. Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. Prior to placing a length of pipe, the end of the previously laid length shall be carefully and thoroughly wiped smooth and clean to obtain an even and close fitting joint.
- E. No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.
- F. Place pipe on minimum 6-inch thick bed of compacted bedding or as detailed on the Contract Documents.
- G. Install pipe, fittings, and accessories in accordance with ASTM C12, ASTM D2321, manufacturer's instructions and/or state or local requirements. Seal joints to be watertight.
- H. Lay pipe to slope gradients noted on Contract Documents with maximum variation from true slope of 1/8-inch in 10-ft.
- I. Place and compact bedding aggregate at sides and to the springline of the pipe as per these Specifications.
- J. Refer to the Section 31 23 33 of these Specifications for backfill requirements. Do not displace or damage pipe when compacting.
- K. Full Lengths of Pipe: Only full lengths of pipe shall be used in the installation except that partial lengths of pipe may be used at the entrance to structures where necessary to obtain a proper connection to the structure.
- L. Pipe Entrances to Structures: All pipe entering structures (e.g.: manholes, catch basins, etc.) shall be cut flush with the inside of the structure, and the cut ends of the pipe and surface of the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges, or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation.
- M. Only full sections of pipe shall be used where entering a structure which will be exposed to view, such as endwalls, headwalls, end sections, etc.
- N. Bedding and Backfilling: The type of materials to be used in bedding and backfilling and the method and placement shall conform to the requirements of these Specifications.

- O. Protection During Construction: The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and or adjacent to any pipe shall be performed at the Contractor's risk.
- P. Tolerance: Pipe shall be laid accurately to the line and grade shown on the Contract Documents and/or as approved by the Owner's Engineer. Allowable tolerances shall be 1/2-inch on grade and 1-inch on line in any section of pipe between structures. Deviations from these tolerances shall be a basis for rejection of the line of pipe by the Owner's Engineer. Any line which has been rejected shall be rebuilt to correct line and grade by the Contractor at his own expense.

3.6 INSTALLATION - INLET STRUCTURES

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place cast-in-place concrete base pad, with provision for storm sewer pipe to be placed at proper elevation.
- C. Place precast reinforced concrete sections with provision for storm sewer pipe sections at the location and elevation specified on the Contract Documents.
- D. Level top surface of each precast concrete shaft sections as assembly progresses.
- E. Establish elevations and pipe inverts for inlets and outlets as indicated.
- F. Lay brick masonry in running bond with full 3/8-inch mortar joints to receive casting assembly. Level casting frame in grout to receive grated inlet or manhole cover.

3.7 PIPE JOINTS

- A. Mortar Joints (RCP): After each length of RCP is laid, the lower portion of the bell shall be filled with mortar, and the succeeding length shall be laid in place so that the inner surfaces of the abutting lengths are flush. The remainder of the joint shall be completely filled with mortar and sufficient additional mortar used to form a bead around the joint flush with the outside diameter of the bell. The inside of the joint shall be wiped and finished smooth. Joints shall be thoroughly wet before the mortar is placed.
- B. Cold Applied Joint Sealer (RCP): Bell and spigot or tongue and groove RCP shall be wiped clean and dry before applying the sealer to the pipe joint. Before the pipes are placed in contact with each other, the spigot end or tongue end of the pipe shall be completely covered with an excess of sealer, and then the pipe shall be laid to the established line and grade so that the inside surfaces of abutting pipe are flush.

3.8 INTERFACE WITH EXISTING FACILITIES

- A. Requirements: The Contractor shall make all required connections of the proposed drainage facilities into existing drainage facilities, where and as shown on the Contract Documents and/or as approved by the Owner's Engineer.
- B. Compliance with Facility Owner Requirements: Connections made into existing drainage facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor will be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with the requirements of the Owner of the existing facility shall be included in the Contract Sum.

3.9 REMOVAL OF EXISTING UTILITIES

- A. The Contractor shall remove and legally dispose of off-site all abandoned utilities encountered during installation of the storm drainage facilities. In particular, all components of the existing combined sewer shall be removed from the site and up to the nearest off-site manhole.

3.10 MODIFICATIONS OF EXISTING STRUCTURES

- A. General: The Contractor shall alter, reconstruct and/or convert existing structures where and as shown on the Contract Documents, and/or as approved by the Owner's Engineer. In general, alterations shall be performed with the same type of material used in the original construction unless otherwise indicated on the Contract Documents or approved by the Owner's Engineer.
- B. Damage to Existing Installations: The Contractor shall exercise extreme care during such alteration, reconstruction and/or conversions so as not to damage any portions of the structure

and/or pipe shown to remain. Any such damage shall be repaired by the Contractor at his own expense and to the satisfaction of the Owner's Engineer and Owner of the damaged structure.

**3.11 CLEANING AND REPAIR**

- A. The Contractor will be required to clean the entire drainage system of all debris and obstructions. This shall include, but not be limited to, removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing storm drains or streams; all debris shall be removed from the system and disposed of in accordance with all governing agencies.
- B. After the system has been cleaned, the Contractor shall thoroughly inspect the system along with the Owner's Engineer and all repairs shown to be necessary shall be promptly made by the Contractor.
- C. All Work of cleaning and repair as specified herein shall be performed at the Contractor's expense and to the complete satisfaction of the Owner's Engineer.

**3.12 FINAL INSPECTION**

- A. Upon completion of the Work and before final acceptance by the Owner, the entire drainage system shall be subject to a final inspection in the presence of the Owner's Engineer and City Engineer. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, and workmanship have been completed to the satisfaction of the Owner's Engineer and the City Engineer.

**END OF SECTION 33 41 00**

- C. Where sanitary sewer lines pass below water lines, lay pipe so that no joint in the sewer line will be closer than 3 feet horizontally to the water line.
- D. Where sanitary sewer lines pass less than 18 inches below the water line, provide concrete encasement. The length of encasement is to be increased to the nearest joint beyond the specified horizontal offset distance.
- E. Make joints between ductile-iron pipe and other types of pipe with standard manufactured ductile-iron adapters and fittings or as directed by the local sewerage authority. Install ductile-iron piping and fittings in accordance with the recommendations of the pipe manufacturer.

3.7 SERVICE LINES

- A. General - The Contractor shall terminate sanitary laterals five feet from the building.
- B. Coordination with Building Contractor - The Contractor will be required to coordinate his work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building. If the Building Contractor has installed his portion of the sanitary sewer service line, work under this contract shall also include final connection of the sanitary sewer service line five feet outside the building line to the building service line at no additional cost to the Owner. The Contractor shall consult the latest architectural/mechanical drawings to confirm lateral locations.

3.8 INSPECTION AND TESTING

- A. General - The Contractor shall test the completed sewer laterals for leakage by low-pressure air test, infiltration and exfiltration tests as specified herein and any other testing required by the local sewer authority. The Contractor shall furnish all necessary equipment, materials and labor for performing the tests as specified. The Contractor shall notify the Owner's Representative and the sewage authority at least 48 hours prior to the start of testing. Sections of pipe tested for infiltration and exfiltration prior to completion of the project shall be subject to additional leakage tests, if warranted in the opinion of the Owner's Representative, and/or the sewage authority prior to acceptance of the project.
- B. Infiltration and Exfiltration Testing - The test length intervals for either type of leakage test shall be approved by the Owner's Representative and the sewage authority, but in no event shall they exceed 1000 feet. In the case of sewers laid on steep grades, the length of line to be tested by exfiltration at any one time may be limited by the maximum allowable internal pressure on the pipe and joints at the lower end of the line.

The test period, wherein the measurements are taken shall not be less than four hours in either type of test.

Depending on field conditions, the following test for leakage shall be employed:

1. Infiltration Test - The test may be used only when groundwater levels are at least four feet above the highest point of the crown of the sewer being tested and after the trench has been backfilled and compacted. The groundwater leakage into the pipe will be measured near the lower end of the section of sewer under test.
2. Exfiltration Test - This test consists of filling the pipe with water to provide a head of at least five feet above the top of the pipe or five feet above groundwater, whichever is higher, at the highest point of the pipe line under test, and measuring the loss of water from the line by the amount which must be added to maintain the original level. In this test, the line must remain filled with water for at least 24 hours prior to the taking of measurements. Exfiltration shall be measured by the drop of water level in a closed-end standpipe or in one of the sewer manholes available for convenient measuring.  

When a standpipe and plug arrangement is used in the upper manhole of a line under test, there must be some positive method of releasing entrapped air in the sewer prior to taking measurements.
3. Leakage Requirements - The total leakage of any section tested shall not exceed the rate of 50 gallons per day per mile per inch of nominal pipe diameter. For purposes of determining the maximum allowable leakage, manholes shall be considered as sections of 48 inch diameter pipe, five feet long, and the equivalent leakage allowance shall be

2.25 gallons per manhole per 24 hours.

- C. Low Pressure Air Testing - The sewer mains and/or laterals shall be tested for leakage by the use of low-pressure air as specified hereinafter or by the local sewage authority and as approved by the Owner's Representative. The test length shall not exceed one interval of pipe between two manholes. Air test procedures may be dangerous and the Contractor shall take all necessary precautions to prevent blowouts.

The proper procedure for air testing of sanitary sewers shall be as described in ASTM C-828, latest edition, entitled "Recommended Practice for Low-Pressure Air Test of Vitrified Clay Pipe Lines (4-12 inches)". Although the title specifies vitrified clay pipe, the same procedure may be used for any other pipe material.

It is important that test plugs be properly installed to prevent blowouts. It is also important to maintain pressure relief devices to prevent system over pressurization.

- D. Correction of Defective Work - If leakage exceeds the specified amount, the Contractor shall, at his own expense, make the necessary repairs or replacements required to permanently reduce the leakage to within the specified limit, and the tests shall be repeated until the leakage requirement is met.

Any defects found in the system are to be repaired at the expense of the Contractor so as to conform strictly to the Specifications and to the satisfaction of the Owner's Representative. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, and sanitary sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance by the Owner.

- E. Compliance with Agency Requirements - In the event of conflict between the leakage test requirements specified herein with the leakage test requirements of agencies having jurisdiction over all or any portion of the sanitary sewers installed under this Contract, the more restrictive requirements shall govern.

### 3.9 CLEANING AND REPAIR

- A. The Contractor will be required to clean the entire sanitary sewer system of all debris and obstructions. This shall include, but not be limited to removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing sanitary sewers or streams; all debris shall be removed from the system.

After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be promptly performed by the Contractor.

All work of cleaning and repair as specified herein shall be performed at the Contractor's expense and to the complete satisfaction of the Owner's Representative.

### 3.10 FINAL INSPECTION

- A. Upon completion of the Work and before final acceptance by the Owner, the entire sanitary sewer system shall be subjected to a final inspection in the presence of the Site Engineer and/or Owner's Representative and local sewerage authority. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, leakage tests and workmanship have been met.

**END OF SECTION 33 30 00**

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**SECTION 33 71 00 UTILITIES**

**PART 1 - GENERAL**

1.1 SCOPE OF WORK

- A. Work under this Section shall consist of providing all labor, plant facilities, materials and equipment necessary and required to install any and all of the electric, telephone and cable television facilities in accordance with the Contract Documents. This Work shall include but not be limited to:
  - 1. Installation of on-site utilities consisting of pipe, conduit and all necessary and required accessory items and operations associated with said installation.
  - 2. Coordinate with the utility companies regarding the installation of utilities within the right-of-way and on-site as required, including connections to existing facilities.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 32 00 00 - General Requirements
- B. Section 31 23 33 - Trench Excavation and Backfill
- C. Local Utility Companies and Governing Agencies
- D. Contract Drawings and Documents

1.3 COORDINATION

- A. All work under this Section shall be coordinated with the gas, electric and telephone utility company and shall comply with all requirements, details, regulations, etc. of said utility company. The Contractor shall coordinate with each utility to define where his limit of work exists before submitting a bid price for this Section.
- B. Work shall be coordinated with the electrical and/or mechanical contractors responsible for building and light standard connections.

**PART 2 - PRODUCTS**

2.1 GENERAL

- A. When available, those materials specified by the appropriate utility company shall be used in lieu of those materials specified in this Section.

2.2 ELECTRIC, TELEPHONE AND CABLE CONDUIT

- A. Concrete and/or plastic conduit shall comply with all requirements of applicable utility companies.

2.3 MANHOLE/PULL PITS

- A. All manholes and pull pits required by the utility company shall comply with all requirements, regulations, specifications, details, and recommendations of said utility company.

**PART 3 - EXECUTION**

3.1 CONSTRUCTION

- A. General:
  - 1. The Contractor shall install all pipe, conduit and duct bank in the locations as shown on the Drawings and/or as approved by the Owner's Engineer and utility company. Pipe and conduit shall be of the type and sizes specified and shall be laid accurately to line and grade. Any necessary structures shall be accurately located and properly oriented.



- B. Excavation and Backfill:
1. When available, those requirements, specifications and procedures, for excavation and backfill, specified by the appropriate utility company shall be used in lieu of these specifications. When such specifications are not available from said utility company, the requirements of this specification shall apply.
  2. The provisions of Section entitled "Trench Excavation and Backfill for Utilities" shall govern Work under this Section.
- C. Storage and Handling of Conduit and Pipe:
1. All pipe and conduit shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in handling. Storage of pipe and conduit on the job shall be in accordance with manufacturer's recommendations, subject to the approval of the Owner's Engineer.
- D. Damage to Pipe and Conduit:
1. Pipe or conduit which is defective from any cause, including damage caused by handling, and determined by the Owner's Engineer as irreparable, shall be unacceptable for installation and shall be replaced at no cost to the Owner as directed by the Owner's Engineer.
  2. Pipe or conduit that is damaged or disturbed through any cause prior to acceptance of the Work shall be repaired, realigned or replaced as directed by the Owner's Engineer, at the Contractor's expense.
- E. Pipe Installation:
1. All piping and conduit shall be laid in accordance with the requirements and procedures specified by the appropriate utility company. When such requirements are not available from said utility company, the requirements of this specification shall apply.
  2. Each length of pipe and conduit shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 312333. Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing the line. Minimum cover over the top of the pipe or conduit shall comply with the utility specifications and shall never be less than 2-ft.
  3. Bedding and Backfilling: The type of materials to be used in bedding and backfilling and the method of placement shall comply with the requirements and procedures specified by the appropriate utility company. When such requirements are not available, the type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements of these specifications and as shown on the Details of the Drawings.
  4. Protection During Construction: The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.
  5. At all times when pipe laying is not in progress, all open ends of pipes shall be closed by temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has passed.
- F. Pipe/Conduit Joints:
1. When available, those specifications and requirements specified by the appropriate utility shall be used in lieu of these specifications. Where such specifications are not available from said utility company, the requirements of this specification shall apply.
  2. All joints are to be made watertight in accordance with the requirements specified herein. Pipe shall be jointed in strict accordance with the Pipe manufacturer's instruction. Jointing of all pipe shall be done entirely in the trench. Assembly of PVC conduit shall be with a solvent type adhesive as recommended by the conduit manufacturer.

- G. Manholes/Pull Pits:
1. Any manholes or pull pits required by the appropriate utility shall be fabricated, bedded, located and backfilled in accordance with said utility requirements and recommendations. Final location(s) shall be approved by the Owner's Engineer.
- H. Connection to Existing Facilities:
1. General: The Contractor shall make all required connections of the proposed utility lines into existing facilities, where and as shown on the Contract Documents and/or as approved by the corresponding utility company. The Contractor shall perform any investigation measures including, but not limited to, exploratory test pits to confirm the point of tie-in and avoidance of other utilities. All investigation measures should be performed a minimum of two weeks prior to the start of utility installation work. Notify engineer of any conflicts. The Contractor shall be responsible for relocating utilities in conflict.
  2. The Contractor shall terminate the electric and telephone conduit at a location specified by the electric and telephone companies.
  3. Compliance with Requirements of Owner of Facility: Connections into existing facilities shall be performed in accordance with the requirements of the owner of the facility. The Contractor shall be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with the requirements of the Owner of the existing facility shall be included in the Contract Sum.
  4. Contractor is responsible for coordinating scope of work along existing facility interfaces with applicable utility companies. Cable pulling and connection of wire and cable to the existing facilities to be performed by others is not covered under this specification section.
  5. Construction shall conform to all requirements of the City and/or any other agencies having jurisdiction.
- I. Service Lines:
1. The Contractor shall install utility conduit to points located within 5-ft of the proposed building lines as shown on the Drawings. All pipes and conduit shall be properly sealed with watertight plugs and shall be clearly marked from above.
  2. The Contractor will be required to coordinate his work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building. If the Building Contractor has installed his portion of the service lines, Work under this Contract shall also include final connections of the service lines of the building line to the building service line at no additional cost to the Owner.
- 3.2 INSPECTION AND TESTING
- A. The Contractor shall perform all inspection and testing of these installations as required by the appropriate utility company and shall bear all costs arising therefrom.
- 3.3 FINAL INSPECTION
- A. Upon completion of the Work and before final acceptance by the Owner, these installations may be subjected to a final inspection in the presence of the Owner's Engineer, a City Representative Engineer or a representative of the utility company. The Work shall not be considered as completed until all requirements for line, grade, cleanliness, tests and workmanship have been met.
- 3.4 AS-BUILT RECORDS
- A. Within 30 days of installation of each utility, Contractor shall maintain records of installed utility lines and provide to owner, owner's engineer and utility companies for purposes of completing as-built plans for the project. Contractor must keep records of, and provide locations and elevations to top of conduit at 50 foot intervals along straight sections of utility, and at all bends and appurtenances along the utility lines.

**END OF SECTION 33 71 00**

# **Section 50 20 00 Environmental Assessment Information**

**PHASE I ENVIRONMENTAL  
SITE ASSESSMENT  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CONNECTICUT**

Prepared For:

Connecticut Department of Administrative Services  
450 Columbus Boulevard  
Hartford, Connecticut 06103

October 2017

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# TABLE OF CONTENTS

	<u>Page</u>
1.0 SUMMARY.....	1
2.0 INTRODUCTION .....	2
2.1 Purpose .....	3
2.2 Scope-of-Services.....	3
2.3 Significant Assumptions.....	3
2.4 User Reliance.....	3
3.0 SITE DESCRIPTION .....	4
3.1 Location and Legal Description .....	4
3.2 Current Use of Property.....	4
3.3 Site and Vicinity General Characteristics.....	4
3.4 Description of Structures, Roads and Other Improvements on the Site.....	4
3.5 Current Uses of the Adjoining Properties .....	5
4.0 USER-PROVIDED INFORMATION.....	5
4.1 Title Records .....	5
4.2 Environmental Liens or Activity and Use Limitations.....	5
4.3 Specialized Knowledge .....	5
4.4 Commonly Known or Reasonable Ascertainable Information .....	6
4.5 Valuation Reduction for Environmental Issues.....	6
4.6 Reason for Phase I ESA .....	6
5.0 RECORDS REVIEW.....	6
5.1 Physical Setting Sources.....	6
5.1.1 Regional Physiology.....	6
5.1.2 Geologic Conditions.....	6
5.1.3 Hydrologic Characteristics .....	7
5.2 Historical Use Information .....	7
5.2.1 Land Title Records .....	7
5.2.2 Aerial Photographs .....	8
5.2.3 City Directories .....	9
5.2.4 Historical Topographic Maps.....	10
5.2.5 Sanborn Fire Insurance Maps.....	11
5.3 Previous Environmental Investigations.....	11
5.4 Standard Environmental Record Sources.....	11
5.4.1 Federal Environmental Record Sources .....	12
5.4.2 State and Tribal Environmental Record Sources.....	13
5.4.3 Additional Environmental Record Sources.....	14
5.5 Regulatory Agency File Review .....	14
5.5.1 Municipal Sources.....	15
5.5.2 Connecticut Department of Energy and Environmental Protection .....	15

6.0	SITE RECONNAISSANCE .....	15
6.1	Methodology and Limiting Conditions .....	15
6.2	Exterior Observations.....	15
6.3	Interior Observations.....	16
6.4	Hazardous Substances or Petroleum Products .....	16
6.5	Storage Tanks .....	16
7.0	INTERVIEWS .....	17
8.0	FINDINGS.....	17
9.0	APPLICABILITY OF THE CONNECTICUT TRANSFER ACT .....	18
10.0	OPINIONS AND CONCLUSIONS .....	19
11.0	DEVIATIONS/DATA GAPS.....	20
12.0	QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS.....	20
13.0	LIMITATIONS.....	20
14.0	SIGNATURES OF ENVIRONMENTAL PROFESSIONALS .....	21

**LIST OF FIGURES  
(at end of report)**

**Figure**

- |   |                   |
|---|-------------------|
| 1 | Site Location Map |
| 2 | Site Map          |

**LIST OF APPENDICES  
(at end of report)**

**Appendix**

- |      |   |
|------|---|
| I    | Tax Map & Tax Card                            |
| II   | Aerial Photographs                            |
| III  | City Directories                              |
| IV   | Historical Topographic Maps                   |
| V    | Sanborn Fire Insurance Maps                   |
| VI   | Environmental Database Report                 |
| VII  | CTDEEP Spill Reports                          |
| VIII | Site Photographs                              |
| IX   | Qualifications of Environmental Professionals |

**PHASE I ENVIRONMENTAL SITE ASSESSMENT  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CONNECTICUT**

**1.0 SUMMARY**

Leggette, Brashears & Graham, Inc. (LBG) completed a Phase I Environmental Site Assessment (ESA) for the property located at 55 Paul Manafort Drive in New Britain, Connecticut (the "Site") on behalf of the Connecticut Department of Administrative Services (CTDAS). This Phase I ESA was conducted in general conformance with the American Society for Testing Materials (ASTM) Standard E 1527-13. The purpose of this Phase I ESA was to investigate and identify land uses that may have the potential to impact environmental conditions at the Site. This information will be used to support soil management related to proposed construction on the Site.

The Site consists of an approximate 2.72-acre parcel of land which is occupied by a large, asphalt-paved parking lot and a building used by Charter Oak State College. The property is part of Central Connecticut State University (CCSU) which occupies a large area north of the Subject Property and across Paul Manafort Drive. The current parcel previously consisted of several separate, smaller parcels until circa 1970 to 1980, during which time the parcels were gradually acquired and combined by the State of Connecticut/CCSU.

The Site is located in an area identified by the Connecticut Department of Energy and Environmental Protection (CTDEEP) with a groundwater quality classification of "GA", indicating that the groundwater is presumed to be suitable for direct human consumption without pretreatment. The site area is serviced by public water with no public or private water supply wells identified in the immediate vicinity. Based on topography, shallow groundwater below the Site is presumed to flow generally to the east or northeast.

The current on-Site building was constructed circa 1999. The building is listed on the Assessor's property card as a single-story building; a single-story entrance level is exposed on the west (parking-lot side) of the building, but the basement level and ground floor are exposed on the east side. The building is reportedly used for academic purposes. An electrical transformer, a stand-by power generator, and cooling fans are located outside the south side of the building. At the direction of the CTDAS, building interior inspection was not conducted as



part of this ESA because the area of primary interest is the parking area to the west of the academic building.

The Site was not identified in any of the environmental databases that were searched. Several surrounding area properties were identified on one or more databases, but most of the listed activities are unlikely to have an impact on the environmental quality of the Site. The property to the west and immediately upgradient of the Site was formerly occupied by a gasoline station and vehicle service station. Although there were no reported releases, this type of activity has the potential to have resulted in releases of petroleum to the environment, and due to its proximity to the Site, any such releases would have the potential to impact environmental conditions below portions of the Site.

There was no historical information or observations from the inspection that suggested that there had been a release of petroleum or hazardous substances on the Site. However, the several residential buildings that occupied the Site area prior to its current use may have used individual underground or aboveground fuel-oil storage tanks and buildings may have contained asbestos-containing materials or lead-based paint. It is not known if these building materials were completely removed prior to the Site's current use. In addition, there is evidence that fill was imported to the Site to grade the Site to support its current uses, and the quality of that fill, if present, is not known.

Section 22a-134 of the Connecticut General Statutes (CGS), known as the Connecticut Property Transfer Act, requires environmental investigation and potentially remediation of hazardous waste "establishments" after a qualifying "transfer of establishment". Our research has not identified on-Site hazardous-waste generation activities that would qualify the Site as an "establishment" under the Transfer Act.

## **2.0 INTRODUCTION**

Leggette, Brashears & Graham, Inc. (LBG) has completed a Phase I ESA for the property located at 55 Paul Manafort Drive in New Britain, Connecticut. This Phase I ESA was conducted in general conformance with the ASTM Standard E 1527-13, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment".

## **2.1 Purpose**

The CT DAS (the “Client”) requested that LBG conduct a Phase I ESA to evaluate the current environmental conditions of the Site. The purpose of this Phase I ESA was to investigate and identify current and past uses of the Site and the practices that may have led to situations referred to as recognized environmental conditions (RECs). REC means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term is not intended to include de minimis conditions that generally do not present a material risk of harm and that generally would not be the subject of an enforcement action.

## **2.2 Scope-of-Services**

The scope of work included: a Site inspection (excluding the building interior), identification of the current land uses on the Site and adjacent properties, a search of federal and state regulatory databases, a review of aerial photographs, city directories, and Sanborn fire insurance maps; and inquiries of persons knowledgeable of the property and local agencies, including the Fire Marshal and Health Department. Future land uses or situations on either the Site or adjacent properties are outside the scope of work.

## **2.3 Significant Assumptions**

Based on topography of the Site and surrounding area, it is assumed the groundwater flow at the Site is generally to the east and northeast. It is assumed that activities within the academic building did not/do not involve the use or storage of hazardous substances or petroleum. Additionally, information provided by others is assumed to be fair and accurate.

## **2.4 User Reliance**

This Phase I ESA was conducted for the use and reliance by the CT DAS, CCSU, the project architect, the project construction administrator and the project general contractor. No use of the information contained in this report by others is permissible without receiving prior written authorization to do so from LBG.

### **3.0 SITE DESCRIPTION**

#### **3.1 Location and Legal Description**

The Site consists of an approximate 2.72-acre parcel of land located south of Paul Manafort Drive, north of Stratford Road and east of Stanley Street in New Britain, Connecticut (figure 1). The Site map identification on the New Britain Tax Assessor's property records is B5A / 22. A copy of the tax map that includes the Site and the property tax card are attached as Appendix I. A site map is provided as figure 2.

#### **3.2 Current Use of Property**

The majority of the Site is used for student and staff parking (cars and light trucks); the on-Site building is used for academic purposes (presumed to be majority classrooms with some offices).

#### **3.3 Site and Vicinity General Characteristics**

The majority of the Site is occupied by an asphalt-paved lot with an approximate area of 80,000 square feet (sf) that is used for student and staff parking. The building is located east of the parking lot and has an approximate footprint of 7,100 sf. It is used as an academic building by Charter Oak State College.

The Site and significant land areas to the south, east and west of the Site are zoned S3 which signifies a high-density single-family residential district. The lot on the east side of Stanley Street and to the immediate west of the Site is zoned B1 which signifies a neighborhood business area. The area to the immediate north of the Site across Paul Manafort Drive is zoned OP which signifies an office and public use district and covers the entirety of CCSU.

#### **3.4 Description of Structures, Roads and Other Improvements on the Site**

The Site building was constructed in 1999. The exterior walls are constructed of brick and masonry materials, and according to the property card, the interior walls are finished with drywall. The roof is covered with asphalt shingles. The property card indicates that utilities are "all public."

The remainder of the Site is occupied an asphalt-paved parking area. Except for access/egress points, the parking lot is surrounded by an iron fence. Concrete sidewalks and

narrow strips of lawn are present along Paul Manafort Drive (north) and Stratford Road (south). Areas to the immediate west of the parking lot and east of the building are also covered with lawn.

### **3.5 Current Uses of the Adjoining Properties**

The lot to the immediate west of the Site is occupied by several, single- and multi-story buildings of various ages that are used for commercial purposes. Tenants include a convenience store, several restaurants, a bakery, a barber and bars. Further to the west is Stanley Street, with primarily single- and multi-family residences beyond. To the south of the Site is Stratford Road and to the east of the Site is the end of Sefton Drive, across which the land is developed with single-family residences. The south side of Paul Manafort Drive east of the Site is also occupied by residential structures. The main CCSU campus is located to the immediate north of the Site across Paul Manafort Drive.

## **4.0 USER-PROVIDED INFORMATION**

LBG requested information from CTDAS, the User, including items identified in the User Questionnaire as specified in ASTM E1527-13. A completed User Questionnaire was provided on September 14, 2017.

### **4.1 Title Records**

Title research was not provided by the User.

### **4.2 Environmental Liens or Activity and Use Limitations**

Information identifying the presence of environmental liens or activity and use limitations was not provided. We note that evidence of environmental liens or activity and use limitations were not identified within the environmental database research (Section 5.4) or by regulatory agency file reviews (Section 5.5).

### **4.3 Specialized Knowledge**

The User had no specialized knowledge of the Site history, other than what is provided elsewhere in this report.

#### **4.4 Commonly Known or Reasonable Ascertainable Information**

The User indicated that the parcel was previously used for residential purposes. The User had no knowledge of spills, releases or environmental cleanups on the parcel.

#### **4.5 Valuation Reduction for Environmental Issues**

No information was provided that would indicate that the property value was reduced for environmental issues.

#### **4.6 Reason for Phase I ESA**

This Phase I ESA was completed specifically to support soil management during construction of a proposed parking garage. This ESA is not being conducted as a result of a property transfer or refinancing. The proposed parking garage project will not affect the existing academic building or the areas immediately surrounding the academic building, so inspection of the interior of the building was not considered essential to completing this ESA for its intended purpose.

### **5.0 RECORDS REVIEW**

#### **5.1 Physical Setting Sources**

##### **5.1.1 Regional Physiology**

The Site is situated on the U.S. Geological Survey (USGS), New Britain, Connecticut topographical quadrangle. The topography of the area that includes the Site slopes gradually down to the east and northeast. Land-surface elevation at the Site ranges between approximately 157 and 165 feet above mean sea level (ft amsl). Land surface at and immediately adjacent to the site slopes down to the west, south and east and is close to the elevation of the adjacent street to the north. The Site was likely regraded and may have also been filled to create current grade levels.

##### **5.1.2 Geologic Conditions**

The surficial materials at the Site are mapped as sand and gravel and uncorrelated deposits associated with ice-dammed ponds (Stone et al., USGS, 1992). Bedrock beneath the Site is mapped as the East Berlin Formation which is a silty shale (Rodgers, 1985); bedrock

immediately east of the Site is mapped as the Hampden basalt. Faults and bedrock structure trend to the north-northeast below the Site area.

### **5.1.3 Hydrologic Characteristics**

The nearest surface-water body to the Site is an unnamed stream that appears to discharge from Stanley Quarter Pond, located approximately 1,800 feet to the northwest of the Site, to Bass Brook, which is located approximately 2,800 feet east of the Site. The stream crosses the CCSU campus approximately 1,000 feet northeast of the Site, but appears to be contained within underground piping below the campus. Stanley Quarter Pond, the unnamed stream and Bass Brook all have a surface-water classification of “A” assigned by the CTDEEP. Designated uses for Class “A” surface waters include fish and wildlife habitat, potential drinking water supplies, recreational use, navigation, agricultural and industrial supply and other legitimate uses. The City of New Britain geographic information system (GIS) assessor’s map shows what appears to be a long, narrow pond or wetland located approximately 300 feet east of the Site and between Sefton Drive and Hillcrest Avenue; the map does not show any outlet for this water body and this water body did not appear on the 2012 USGS topographic map of the area. It may represent the headwaters of a stream that was depicted on the 1892, 1893 and 1906 topographic maps that was cut off by subsequent development.

The groundwater quality beneath the Site is classified by the CTDEEP as “GA.” “GA” groundwater is presumed to be suitable for direct human consumption without pretreatment. Large areas south and west of the Site have a GB groundwater classification due to their historical urban development. The CTDEEP mapping does not identify any aquifer protection areas or areas of GAA groundwater classification within a one-mile radius of the Site.

Based on topography and drainage patterns, shallow groundwater at the Site is presumed to flow generally to the east or northeast below the Site. The depth to groundwater below the Site is not known, but is estimated to be 10 to 20 feet below grade.

## **5.2 Historical Use Information**

### **5.2.1 Land Title Records**

The City of New Britain land records indicate that the Site is currently owned by the State of Connecticut - CCSU. Prior to circa 1970, the 2.72-acre Site area was comprised of

several smaller lots that appear to have been used for residential purposes. LBG attempted to identify owners prior to CCSU and the State of Connecticut by reviewing historical property cards at the City of New Britain Assessor’s office. The following ownership information was obtained. LBG did not review the individual documents listed in the Assessor’s records. Note that the following does not constitute a title search and may be incomplete.

Lot No.	Owner Prior to CCSU or State of Connecticut			Date Acquired by CCSU or State of Connecticut
	Volume/Page	Date	Listed Owner	
8	527/1	10/6/1961	Leonard and June Ventura	4/29/1970
9	688/951	8/2/1972	Abraham J., Ralph J., Joseph F. Kolodney	4/7/1980
10	598/323	5/25/1966	Dorothy V. VanGorder	5/4/1979
11-14	None found			4/9/1970
15	481/71	2/16/1959	Martin J. and Mary E. Rabis	12/19/1979
16	537/95	5/31/1962	Stanford E. and Anna M. Rich	6/28/1972
17	619/458	6/21/1967	Irene Sher, June S. Rosen, Gloria S. Levine	12/5/1979
18-19	None found			5/6/1970
20	305/119	7/17/1945	Albert J. and Gertrude E. Havlick	1/17/1979
21	755/387	2/16/1980	Harry L. Stromquist	2/27/1980
22-25	None found			4/4/1972
26	691/879	15/5/1972	Edyth E. Gittleman	4/16/1979
27	711/93	5/12/1975	Anton J. Spring, Stacia M. Spring and Ida H. Spring	12/18/1978
28	8/2/1972	688/951	Abraham Kolodney, et. al.	4/7/1980

The above information does not provide any information as to the uses of the properties, but suggests ownership consistent with residential uses, as indicated by other sources.

### 5.2.2 Aerial Photographs

LBG obtained historical aerial photographs of the Site from Environmental Data Resources, Inc. (EDR) for the years 1934, 1941, 1951, 1957, 1962, 1970, 1972, 1986, 1990, 1992, 1996, 2005, 2006, 2008, 2010 and 2012. The following is a summary of the information obtained from aerial photographs. The EDR Aerial Photo Decade Package is included as Appendix II.

The 1934 and 1941 aerial photographs depict what appears to be residential development along both sides of what is now Paul Manafort Drive (note that Paul Manafort Drive was previously named Francis Street) and somewhat limited residential development along Stratford Road. The parcel immediately west of the Site appears to have commercial development or mixed development. The oldest CCSU buildings are visible to the north of the Site and facing Stanley Street. There is a large area of cleared land and possible playing fields or tennis courts on the CCSU tract. The unnamed stream is visible at the northeast corner of the CCSU tract. The 1951 aerial photo shows some additional residential buildings on the Site, and additional buildings on the CCSU tract and on the tracts along the south side of Stratford Road.

The 1957 and 1962 photos depict the Site relatively unchanged from the 1951 photo. Increased development of the CCSU campus is evident in this period. There also appears to be some additional development along the south side of Stratford Road. By 1970, the CCSU campus has expanded south to Paul Manafort Drive (residential development along the north side of Paul Manafort Drive across from the Site is no longer present). By 1972, some of the residential buildings on the Site appear to have been removed and portions of the Site may be occupied by parked vehicles or piles of unknown materials.

The 1986 photo clearly shows a paved parking area on the Site with two or more of the previous residential buildings remaining in the eastern portion of the Site. The large buildings in the center of the parcel to the west of the Site appear to have been removed. By 1990, a new building has been constructed on the parcel to the west of the Site and a small building on the north end of that parcel appears to have been removed. The 1992 photo is similar.

On the 1996 photo, there appear to be no structures on the Site except perhaps for a small garage, shed or tent at the west end of the Site. The majority of the Site appears paved and in use for parking. The area of the current academic building is cleared and no longer appears to be in use for parking.

The 2005, 2006, 2008, 2010 and 2012 photos show the Site in its current configuration. Surrounding properties show little change in this period.

### **5.2.3 City Directories**

LBG obtained historical city directory listings for Francis Street (Paul Manafort Drive), Stratford Road and Stanley Street from EDR for the years 1964, 1968, 1972, 1976, 1985, 1992,



1995, 1999, 2003, 2008 and 2013 to supplement our understanding of historical Site occupancy. The EDR City Directory Image Report is included as Appendix III. The directory listings are summarized below:

Francis Street (#7 – 65; to 2003): All listings in the 1964, 1968, 1972 and 1976 directories appear to be individuals and some of the names are consistent with the names on the historical property cards for the Site. The 2003 directory had a listing for only 18 Francis Street (“unknown occupant”), but other sources indicate that Francis Street was no longer present in this area at this time and the new academic building had already been constructed.

Paul Manafort Drive (beginning 1999): Over the period 1999 to 2013, the various occupants of 55 Paul Manafort Drive are listed as Charter Oak State College, Board for State Academic Awards, Connecticut State Department of Education, and the State of Connecticut.

Stratford Road (#3 – 48): All listings in the 1964, 1968, 1972 and 1976 directories appear to be individuals and some of the names are consistent with the names on the historical property cards for the Site. There was a listing for a builder at #15 Stratford Road (1968). Beginning in 1985, only even numbers were listed (south side of street), except for a listing at #17 Stratford Road in 2003 and 2013.

Stanley Street (#1517 - 1543): The various occupants of the commercial property to the west of the Site over the period include grocery and convenience stores, drug store, service station, post office, laundry, pizza shop and other restaurants, discount store, copy center, book store, dental practices, barber shops, beauty salons, insurance offices, travel agency, donut shop/coffee shop, ice cream/yogurt shop, tattoo parlor, massage parlor, drain service (plumber), individuals, and other unspecified businesses. The service station was listed as Belvidere Service Station at 1523 Stanley Street to 1976 and possibly as Grand Central’s Station at 1543 Stanley Street (in 1985).

#### **5.2.4 Historical Topographic Maps**

LBG reviewed historical topographic maps for the years 1892, 1893, 1906, 1944/46, 1946, 1952/53, 1964/66, 1972/73, 1984, 1992, and 2012. The EDR Historical Topo Map Report is included as Appendix IV.

The area of the Site appears undeveloped in the 1892, 1893, and 1906 maps. In addition to the unnamed stream located to the north of the Site, these early maps show another stream southeast of the Site that flows to the north and intersects the unnamed stream. The 1944/46, 1946, 1953/53 map shows Francis Street and Stratford Road and the State Teachers College on the CCSU parcel. The stream noted above to the southeast of the Site, is no longer visible. The 1964/66, 1972/73 and 1984 maps show expansion of the CCSU campus complex. The above maps show no detail regarding buildings located on or adjacent to the Site, other than those on

the CCSU campus. Beginning on the 1952/53 map, the Site area is shaded as representing a developed area.

The 1992 map shows new buildings on the parcel to the west of the Site; there are no buildings specifically depicted on the Site. The CCSU campus is now labelled as Central Connecticut University. The 2012 map shows no building detail.

### **5.2.5 Sanborn Fire Insurance Maps**

LBG reviewed Sanborn Fire Insurance Maps for the years 1950, 1954, 1959, 1961, 1963, 1965 and 1978. The EDR Certified Sanborn Map Report is included as Appendix V.

The 1950 Sanborn map shows residential development on most of the individual parcels that were merged to form the current 2.72-acre Site parcel; some of the lots are vacant. Residential development is also present along the north side of Francis Street and the south side of Stratford Road. There was a dairy in the rear of one of the lots on the north side of Francis Street. Commercial development, including a gasoline filling station (with tanks), is present on the lots immediately west of the Site. The 1954, 1959, 1961, 1963 and 1965 maps show similar conditions.

The 1978 Sanborn map shows that several of the buildings have been removed from the Site and an area on the Site is designated for parking. The CCSU campus has expanded south to Francis Street, so the residential buildings previously located on the north side of Francis Street have been removed. The filling station remains on the parcel to the west of the Site.

### **5.3 Previous Environmental Investigations**

LBG was not provided with any previous environmental investigation reports of the Site that would be relevant to this ESA. No reports were identified in the CTDEEP file search.

### **5.4 Standard Environmental Record Sources**

Federal, state and tribal environmental databases were reviewed for the Site in an effort to determine the regulatory status of the Site and to establish the location of surrounding properties with environmental records. A search of U.S. Environmental Protection Agency (U.S. EPA) and CTDEEP databases was completed by EDR. The EDR Radius Map Report is included as Appendix VI.

Based on the inferred groundwater flow direction to the east or northeast, the facilities identified by the EDR database search to an upgradient distance of 1,000 feet (the focused search area) were evaluated to determine if the recorded activities have the potential to impact the subsurface conditions at the Site.

#### 5.4.1 Federal Environmental Record Sources

Information from ASTM E 1527-13 specified Federal databases for the Site as provided by EDR was reviewed by LBG. The databases reviewed, and the approximate search distances used are presented in the table below.

Federal Database	Radius Searched
National Priorities List (NPL), Proposed NPL and Delisted NPL database.	1 mile
Federal Superfund Liens (NPL LIENS)	Target Property (TP)
Federal Facility Site Information Listing (FEDERAL FACILITY)	1 mile
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and CERCLIS - No Further Remedial Action Planned (CERCLIS-NFRAP) database of potentially hazardous waste sites.	0.5-miles
Resource Conservation and Recovery Act Hazardous Waste Treatment, Storage or Disposal Facility (RCRA-TSD).	0.5-miles
Corrective Action Reports (CORRACTS) for Hazardous Waste handlers.	1 mile
RCRA Large, Small and Conditionally Exempt Small Quantity Generators (RCRA-LQG, RCRA-SQG & RCRA-CESQG) of Hazardous Waste	0.25-miles
Federal Institutional Control/Engineering Control Registries (US ENG CONTROLS & US INST CONTROL)	0.5-miles
Federal Emergency Response Notification System list (ERNS)	TP
Facility Index System/Facility Registry System (FINDS)	TP

The Site was not identified on any of the ASTM E 1527-13 specified Federal databases. No other properties were identified in the EDR report to be within the ASTM search distances for the above federal-agency databases.

### 5.4.2 State and Tribal Environmental Record Sources

Information from ASTM E 1527-13 specified State and Tribal databases for the Site area as provided by EDR was reviewed by LBG. The databases reviewed, and the approximate search distances used are presented in the table below.

State Database	Radius Searched
State Hazardous Waste Sites (SHWS) database of hazardous waste disposal sites.	1 mile
Site Discovery and Assessment Database (SDADB) database of facilities suspected of hazardous waste disposal.	0.5-miles
State Solid Waste Facility/Landfills (SWF/LF) database of solid waste disposal facilities, landfills and transfer stations.	0.5-miles
State Leaking Underground Storage Tank (LUST) and Leaking Underground Storage Tanks on Indian Land (INDIAN LUST) databases.	0.5-miles
Connecticut Leachate and Wastewater Discharge Sites (LWDS) include discharges, waste disposal sites and spills historically mapped by the Connecticut Department of Environmental Protection.	1 mile
State Registered Underground Storage Tanks (USTs)	0.25-miles
State Registered Aboveground Storage Tank (AST) database of bulk petroleum facilities that receive petroleum by marine vessels. Underground Storage Tanks on Indian Land (INDIAN UST) and Underground Storage Tank Listing (FEMA UST).	0.25-miles
ELUR Sites (AUL) database of state and tribal institutional control and engineering control registries.	0.5-mile
State Voluntary Cleanup Program Sites (VCP) and voluntary cleanup sites on Indian land (INDIAN VCP).	0.5-miles
Brownfield Sites	0.5-miles

The Site was not identified in any of the ASTM E 1527-13 specified State and Tribal databases. Several off-site properties were listed in the EDR report to be within the ASTM search distances for the above databases (LUST, SHWS, SDADB, and Brownfield). All listed properties were located outside of the focused search area at locations downgradient of the Site, at a lower elevation than the Site, or at upgradient locations more than 1,000 feet from the Site. Additional details about the state and tribal database listings are included in the EDR report.

### 5.4.3 Additional Environmental Record Sources

Additional database records were provided in the EDR report. LBG reviewed these non-ASTM scope databases for listings for the Site and nearby listings and found none that were relevant to the Site and this ESA except those listed below.

- The CTDEEP maintains a database of Hazardous Waste Manifests that have been returned to the State following the shipment of a hazardous waste. There were no waste-manifest records listed for the Site address.
- There were shipments of hazardous waste on record for the parcel immediately west of the Site. Waste flammable liquids (D001) that may have been related to decommissioning of the gasoline station were shipped from 1523 Stanley Street (200 gallons on 9/21/1987) and 1537 Stanley Street (490 gallons on 2/26/1988). In addition, there was a shipment of 2 gallons of D011 (silver) waste from 1537 Stanley Street on 11/9/1990, possibly from a dental practice or film-processing service.
- Hazardous-waste solids were shipped from other nearby parcels including 1516 Stanley Street (D008 waste, possibly from a lead abatement or building demolition, 11/24/1998), 6 Wellington Street (D008 waste, possibly from lead abatement, 10/6/1999), 93-95 Sefton Street (D008 waste, possibly from lead abatement, 6/23/1998).
- There were other records of hazardous-waste generation identified in the database search, but none within 1,000 feet from the Site.
- EDR also lists historical automobile service stations (EDR HIST AUTO) in their database. A gasoline service station was listed at 1529 Stanley Street (immediately west of the Site) from 1969 through 1976.
- There were listings for CCSU at 1615 Stanley Street, including leaking underground storage tanks (power plant and Well Road), permits, violations and numerous shipments of hazardous wastes. The exact locations of these activities on the CCSU campus are not known. However, it is unlikely that most activities on the main CCSU campus to the north of the Site would impact the subsurface conditions at the Site.

### 5.5 Regulatory Agency File Review

The following sections summarize relevant information obtained from state and municipal agency files.

### **5.5.1 Municipal Sources**

The City of New Britain's Assessor records indicated the Site building was constructed in 1999. Requests for information were made to the City of New Britain Fire Department and the Building Department; no files pertaining to the Site (as 55 Paul Manafort Drive) were identified. A request was also made to the City Health Department; to date there has been no reply or information provided.

### **5.5.2 Connecticut Department of Energy and Environmental Protection**

LBG reviewed available public files for the Site at the CTDEEP file room. A request was made for files associated with the Site address (55 Paul Manafort Drive) with Remediation, Solid Waste, Hazardous Waste, Underground Storage Tanks and Permits. No files were identified for the Site. Four Oil and Chemical Spills Reports were identified for the area near the Site. Three involved minor motor vehicle-related releases of small quantities of automotive fluids at Stratford Road and Stanley Street (10/22/2015), Francis Street and Stanley Street (11/02/2001), and 1517 Stanley Street (10/24/1999). The fourth (12/15/2010) was a release of one gallon of gasoline due to a hose failure at 1537 Stanley Street. All were listed as closed. Copies of the reports are provided in Appendix VII.

## **6.0 SITE RECONNAISSANCE**

### **6.1 Methodology and Limiting Conditions**

The Site inspection was completed by Michael Susca of LBG on September 5, 2017 after meeting with James Grupp of CCSU Facilities Management. The inspection was completed to obtain information regarding recognizable environmental conditions and to evaluate potential environmental concerns on or adjacent to the Site. Select photographs from the Site inspection are included in Appendix VIII.

### **6.2 Exterior Observations**

The Site, including the area surrounding the building, was inspected during the site visit. The large paved parking area was inspected and pavement was observed to be generally in fair condition (some pavement patches were observed in aerial photos). Minor oil staining was observed on the pavement, likely from parked cars. Catch basins were observed in the paved

area and west and north of the academic building. A Site map provided by CT DAS shows that the on-Site catch basins are connected to storm sewer lines below Paul Manafort Drive. There were several pole-mounted parking-lot lights and concrete bases for parking lot lights. Small (approximately one foot by two foot) metal plates, possibly associated with walkway lighting and street-crossing lights, were noted at several locations on the north side of the property.

There was a strip of lawn between the parking lot and the adjacent sidewalks to the north and south and lawn areas to the east of the academic building and along the western site boundary. There were additional landscaped areas close to the building. There was no evidence of significantly stressed vegetation. Within the lawn area along Stratford Road there was a vertical support with two meter boxes and second set of supports that were not in use.

The exterior of the building, including the roof, was in good condition. Natural-gas piping and meter were observed outside the southern building wall; suggesting the source of heat for the building. There was a fenced enclosure to the south of the building that contained what appeared to be a stand-by electrical generator and two cooling units/heat exchangers. The fuel source for the stand-by generator was later confirmed to be natural gas.

A pad-mounted electrical transformer was identified on the parcel and located approximately 40 feet south of the building. The transformer may contain dielectric fluid, but the label on the transformer indicated “Non PCB, Less Than 2 PPM”; there was no evidence of leakage from the transformer. A possible pole-mounted transformer was observed on a light pole located along the north side of Stratford Road and adjacent to (but off of) the Site.

### **6.3 Interior Observations**

A building interior inspection was not conducted.

### **6.4 Hazardous Substances or Petroleum Products**

Hazardous substances or petroleum products were not observed in the visible portions of the Site during the Site inspection.

### **6.5 Storage Tanks**

No evidence of any aboveground or underground storage tanks were observed during the Site inspection. The Site building appears to be heated by a natural gas-fired system. The stand-

by power generator is fueled by natural gas; the area of the stand-by generator and the cooling fans was not accessible for close inspection.

## **7.0 INTERVIEWS**

Mr. James Grupp of CCSU Facilities Management coordinated the site inspection and provided general direction. CCSU staff provided access to maps and old reports from the 1970s and 1980s that pertained to the acquisition of the various individual properties that were then consolidated to create the Site. The reports provided no detail on the environmental condition of the individual properties or the Site. CCSU staff indicated that, circa 1980s, one of the previous residential buildings acquired by CCSU (18 Francis Street) was used to house or entertain alumni visitors until it was removed to construct the new academic building. (Note that Paul Manafort Drive was previously named Francis Street).

Mr. Henry Altmann, Coordinator of Capital Projects and Facilities Planning at CCSU was designated as the Site contact. He provided a completed Owner Questionnaire on September 19, 2017 and additional information via email on September 18, 2017. He was unaware of any on-Site uses involving hazardous substances. He also confirmed that the on-Site stand-by generator is fueled by natural gas and that water and sanitary services to the property are provided by public utilities. He was unaware of any litigation, administrative proceedings or violations of environmental laws involving hazardous substances or petroleum products that are associated with the Site.

## **8.0 FINDINGS**

The findings below are based on the work conducted as part of this assessment:

- The Site consists of an approximate 2.72-acre parcel that is occupied by a one-story academic building operated as Charter Oak State College and an asphalt-paved parking lot. According to the property card, the owner of record is the State of Connecticut – CCSU.
- The Site is located within a densely developed urban area that was first developed prior to 1930. The CCSU campus is immediately north of the Site. CCSU is the successor to the Connecticut Teachers College, which occupied a portion of the CCSU campus north of the Site beginning prior to 1934. To the south and east of the Site are residential buildings and to the immediate west are commercial buildings.



- The Site is located in an area with a groundwater quality classification of “GA.” The Site area is served by public water with no public or private water supply wells identified in the immediate vicinity. Based on topography and area drainage patterns, shallow groundwater is presumed to flow generally to the east or northeast.
- Prior to approximately 1972, the Site was comprised of several, separate, privately owned parcels, many of which were occupied by individual dwellings. They were gradually acquired by the State of Connecticut/CCSU until they were fully consolidated circa 1980. The last of the old buildings was removed in the early 1990s.
- The current academic building was constructed circa 1999. The exterior of the building was in good condition. An interior inspection was not conducted.
- No recorded evidence of USTs, industrial activities, spills or releases on the Site was found.
- A pad-mounted transformer is located on the Site and a possible pole-mounted transformer is located adjacent to the Site. No evidence of a release was observed and no reports of spills or releases from either unit were identified in the database search.
- An on-Site stand-by power generator that is fueled by natural gas is present on the south side of the building.
- Records indicate some minor releases at locations upgradient of the Site, but none were on the Site and none were of sufficient volume that would be likely to impact the Site.
- There were records of hazardous wastes being generated at sites within 500 feet of the subject Site; most were waste solids that would not be expected to impact the Site.
- Records indicate that waste flammable liquids (likely from UST cleanout) were generated and petroleum USTs were historically used on the parcels immediately west of the Site. No records were found that identified historical petroleum releases from the USTs or service-station operations.

## **9.0 APPLICABILITY OF THE CONNECTICUT TRANSFER ACT**

Section 22a-134 of the Connecticut General Statutes (CGS), known as the Connecticut Property Transfer Law, requires environmental investigation and potentially remediation of “establishments” after a qualifying “transfer of establishment”. An “establishment” is defined as “any real property at which or any business operation from which (A) on or after November 19,

1980, there was generated, except as the result of remediation of polluted soil, groundwater or sediment, more than one hundred kilograms of hazardous waste in any one month, (B) hazardous waste generated at a different location was recycled, reclaimed, reused, stored, handled, treated, transported or disposed of, (C) the process of dry-cleaning was conducted on or after May 1, 1967, (D) furniture stripping was conducted on or after May 1, 1967, or (E) a vehicle body repair facility was located on or after May 1, 1967.”

Our research has not identified any uses that would automatically qualify the Site as an “establishment” under the Property Transfer Law. In addition, there are no documented shipments of hazardous waste from the Site within currently available governmental databases or other evidence of hazardous waste activities at the Site and there is no evidence to suggest that hazardous wastes were generated at the Site. It should be noted that shipments of waste from CCSU appear to carry the 1516 Stanley Street address regardless of the point of origin of the waste. Note that this ESA is being conducted to support soil management during proposed future construction on the Site and not in connection with a property transfer. The Property Transfer Law would only apply in the event of a transfer of an establishment.

## **10.0 OPINIONS AND CONCLUSIONS**

LBG has completed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-2013 for the property identified as 55 Paul Manafort Drive in New Britain, Connecticut. This assessment has not identified evidence of a REC, as defined by ASTM, in connection with the Site. However, given the nature of the historical on-site and nearby land use, the following conditions should be considered prior to conducting future construction activities on the Site.

- The Site was previously occupied by a number of small residential dwellings. Each likely at some time used an UST or an aboveground tank within the basement to store fuel oil for on-site heating. Any such tanks that were not properly removed or closed at the time of building demolition could have been or could be a source of petroleum contamination to soil and groundwater.
- Historical building materials may have contained lead-based paint or asbestos. It is not known if these building materials were completely removed from the Site at the time of demolition.

- The Site may have been filled to raise grade level along Stratford Road and west of the academic building prior to being graded and paved. The source and quality of imported fill, if present, is not known.
- The long-term underground storage of petroleum motor fuels and possible vehicle repair on the properties immediately west and upgradient of the Site, have the potential to impact soil and groundwater quality beneath the Site, particularly below the western portions of the Site. No significant releases were on record for the properties immediately upgradient of the Site.
- Given the proximity of the historical gasoline station to the Site (within 1/10<sup>th</sup> of a mile), the potential for a vapor encroachment condition (migration of volatile petroleum vapors through the soil) cannot be ruled out.

#### **11.0 DEVIATIONS/DATA GAPS**

Data gaps identified relative to the ASTM standard include:

- Chain of Title documentation for the Site was not provided. A limited review of property cards filed at the New Britain Assessor's office was conducted. However, that search would not be sufficient to identify existing recorded activity and use limitations on the Site, if they exist.
- LBG did not attempt to locate or interview prior owners of the Site.
- LBG did not inspect the interior of the on-Site building.

It is our opinion that the identified data gaps are not significant relative to the intended use of this ESA. It is our understanding that the Superfund protection offered by the All Appropriate Inquiry Phase I Environmental Site Assessment process is not relevant to the User based upon LBG's understanding of the intended use of this document.

#### **12.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS**

Resumes for LBG personnel involved in the ESA are presented in Appendix IX.

#### **13.0 LIMITATIONS**

The purpose of this Phase I Environmental Site Assessment is to identify potential impacts to the environment status of the physical conditions (i.e., soil, groundwater, etc.) at the

Site, due to the use, storage or disposal of hazardous or toxic materials or wastes. As such, any other property conditions or characteristics are not addressed in the scope of work for this report. The scope of work does not include, nor should the report be considered as, an audit of compliance with environmental permits, management practices, or federal, state or local laws and regulations, even though in the course of work such information may be obtained and noted in the report.

The conclusions stated above have been developed from what is considered to be a reasonable investigation based on the present and past land use of the Site and the property's location with respect to adjacent land uses. The conclusions, to some degree, are based upon information provided by others as referenced or noted in the report. Reasonable efforts have been made to confirm the information with other sources; however, LBG is not responsible for missing or incomplete information if such information is not available at the source or provided at LBG's request, or if such information cannot be obtained within the time constraints of the work or within a level of effort reasonable for the work being completed.

The conclusions and/or recommendations are applicable to areas of the Site that were accessible at the time of inspection and represent the conditions observed in those areas. Areas that were hidden, covered or otherwise inaccessible to inspection (including the interior of the building) are not covered by the conclusions and recommendations. The conclusions and recommendations are based in part on conditions observed on the Site at the time of the inspection. The conclusions do not include subsequent changes to the Site, or use of the Site, which could alter the environmental status of the property from its present condition.


This report, and all work associated with it, has been completed solely for the use of the CTDAS, CCSU, the project architect, the project construction administrator and the project general contractor.. Use of the report by others, or conclusions drawn from the information contained herein without confirmation by LBG, is done at the users risk. LBG asserts that the data are complete and appropriate at the time and for the work conducted, but is not responsible for the use of the information for purposes for which it was not intended.

#### **14.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS**

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in 312.10 CFR 312. We have the specific

qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Site. We have developed and completed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.


LEGGETTE, BRASHEARS & GRAHAM, INC.

  
Corey Hedges  
Hydrogeologist



Michael Susca, CPG, LEP  
Senior Associate

Reviewed by:

  
William K. Beckman, P.E., LEP  
Senior Vice President

nv

October 13, 2017

H:\CT DAS\CCSU Parking\Phase I\Phase I ESA.doc

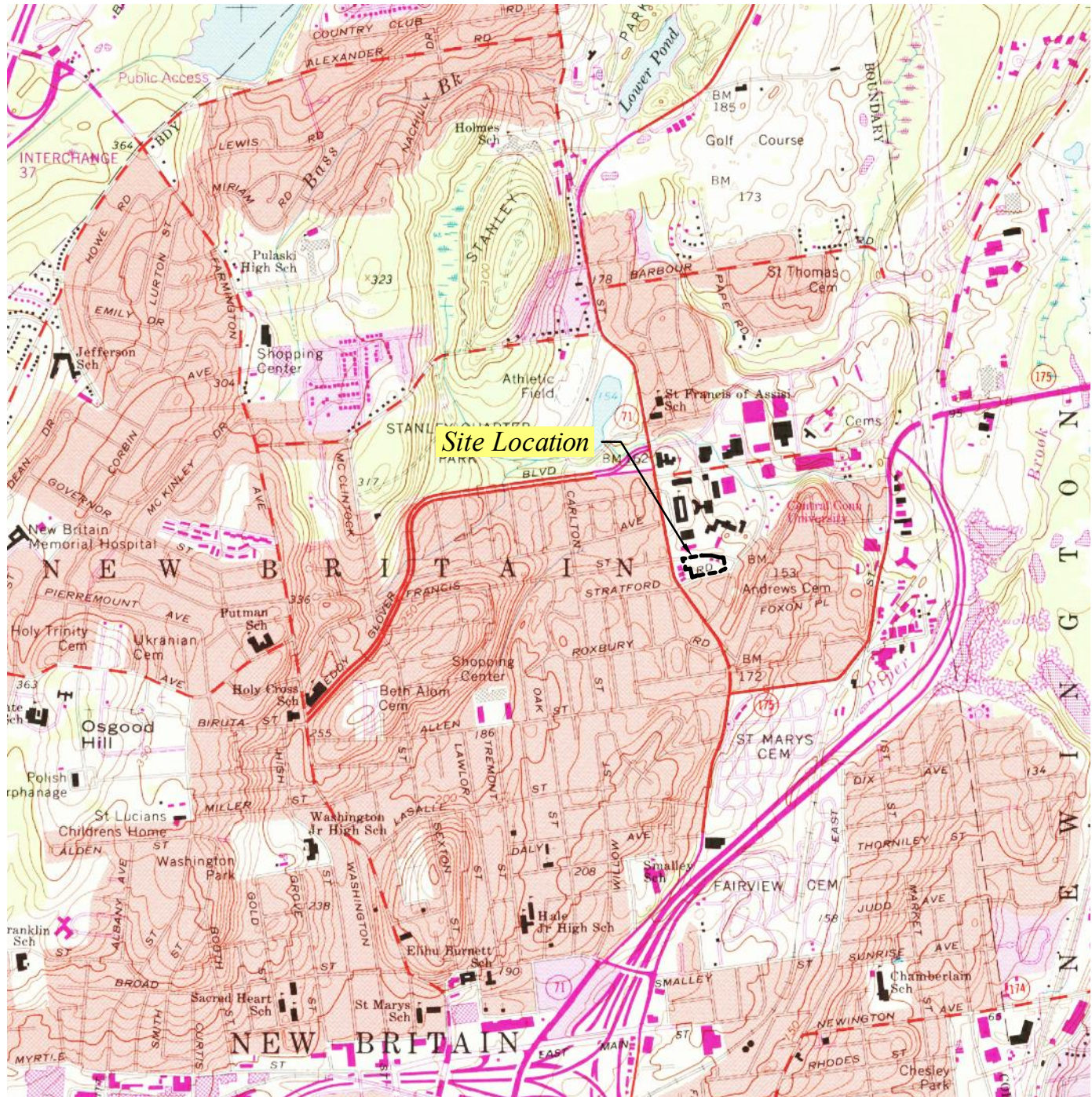
## REFERENCES

Rodgers, John, *Bedrock Geological Map of Connecticut*, CTDEEP/United States Geological Survey, 1985.

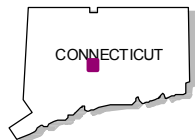
Stone, Janet, Radway, et al, *Surficial Materials Map of Connecticut*, United States Geological Survey, 1992.

## **FIGURES**

O:\DWG\CT DAS\New Britain\55 Paul Manafort D:\CCSU\F1\_SLM.dwg\_Layout1\_9/22/2017 9:28:33 AM\_AcroPlotTemp4384.pct



SOURCE: USGS TOPOGRAPHIC QUADRANGLE NEW BRITAIN, CONNECTICUT (REVISED 1992).



QUADRANGLE LOCATION



CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES  
 55 PAUL MANAFORT DRIVE  
 NEW BRITAIN, CONNECTICUT

SITE LOCATION MAP

DATE	REVISED

PREPARED BY: **LEGGETTE, BRASHEARS & GRAHAM, INC.**  
 Professional Groundwater and Environmental Engineering Services

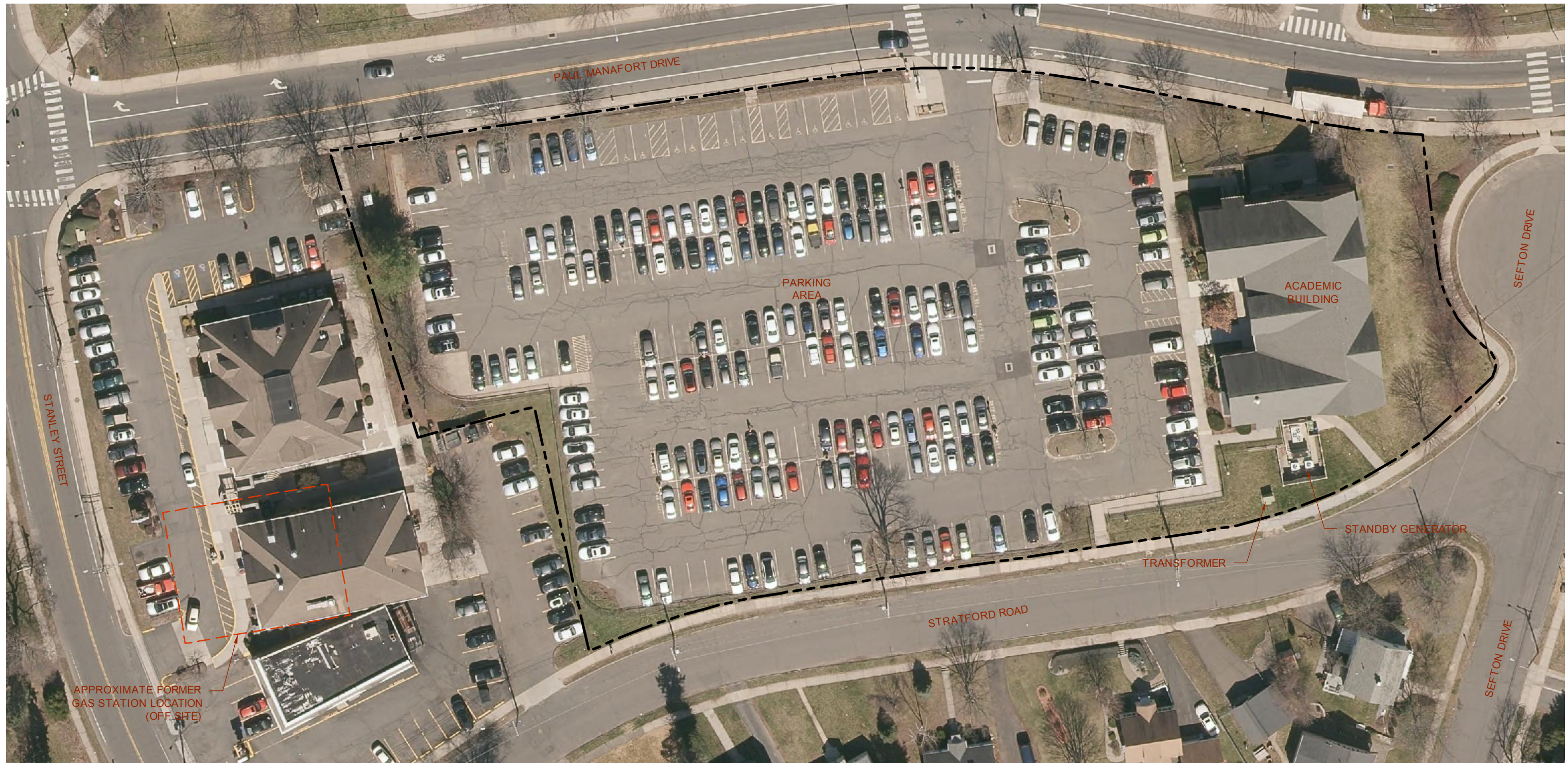


6 Executive Drive  
 Suite 109  
 Farmington, Connecticut 06032  
 (860) 678-0404

DRAWN:	RAC	CHECKED:	MS	DATE:	09/22/17	FIGURE:	1
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**LEGEND**  
 - - - - - PROPERTY BOUNDARY



CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES  
 55 PAUL MANAFORT DRIVE  
 NEW BRITAIN, CONNECTICUT

SITE MAP

DATE	REVISED	PREPARED BY:
		<b>LEGGETTE, BRASHEARS &amp; GRAHAM, INC.</b>
		Professional Groundwater and Environmental Engineering Services
		6 Executive Drive Suite 109 Farmington, Connecticut 06032 (860) 678-0404
<b>DRAWN:</b>	RAC	<b>CHECKED:</b> MS
		<b>DATE:</b> 09/22/17
		<b>FIGURE:</b> 2

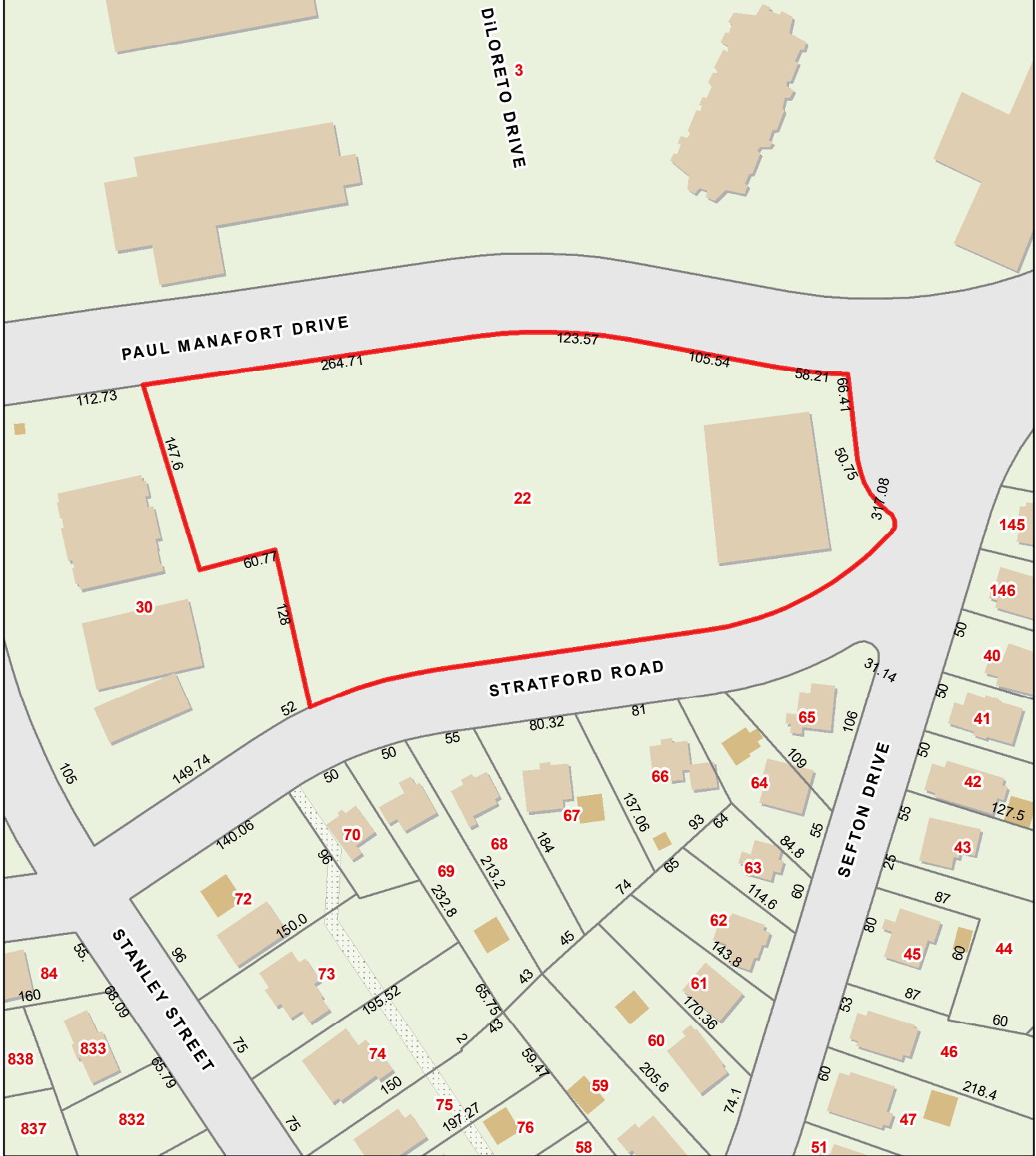
**APPENDIX I**

**TAX MAP AND TAX CARD**

# City of New Britain, Connecticut - Assessment Parcel Map

MBL: B5A 22

Address: 55 PAUL MANAFORT DR



Approximate Scale:  
1 inch = 100 feet

Disclaimer:  
This map is for informational purposes only.  
All information is subject to verification by any user.  
The City of New Britain and its mapping contractors  
assume no legal responsibility for the information contained herein.

Map Produced Feb 2017



Property Information

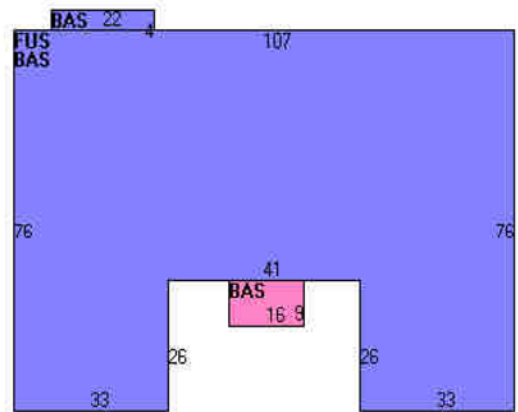
Property Location	55 PAUL MANAFORT DR
Owner	CONNECTICUT STATE OF- CCSU
Co-Owner	
Mailing Address	1615 STANLEY STREET NEW BRITAIN CT 06053
Land Use	901C CCSU MDL-94
Land Class	E
Zoning Code	S3
Census Tract	417200

Neighborhood	104L
Acreage	2.72
Utilities	All Public
Lot Setting/Desc	Level
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	1999
Stories	1
Building Style	College/Univ
Building Use	Comm/Ind
Building Condition	B
Floors	Ceram Clay Til
Total Rooms	

Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Flat
Roof Cover	T&G/Rubber

Exterior Walls	Brick/Masonry
Interior Walls	Drywall
Heating Type	99
Heating Fuel	Yes
AC Type	None
Gross Bldg Area	14364
Total Living Area	14364



Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	2798100	1958670
Extras	0	0
Improvements	2885000	2019500
Outbuildings	86900	60830
Land	253000	177100
Total	3138000	2196600

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	7298	7298
Finished Upper Story	7066	7066
Total Area	14364	14364

Outbuilding and Extra Items

Type	Description
Paving Asphalt	80000.00 S.F.
Lights 2	6.00 Units

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONNECTICUT STATE OF- CCSU		1/1/1900	

**CURRENT OWNER**  
 CONNECTICUT STATE OF-CCSU  
 1615 STANLEY STREET  
 NEW BRITAIN, CT 06053  
 Additional Owners:

TOPO. Level	UTILITIES	STRT./ROAD	LOCATION
1 All Public	1 Paved		

**SUPPLEMENTAL DATA**

Other ID: 70750055  
 Census Tract 1 and E: 417200  
 Style Type: Downtown  
 Units: BIOSCIENBS  
 LAND E/OW: ASSOC PID# 1223

DESCRIPTION	Code	Appraised Value	Assessed Value
COMM 200	200	2,798,100	1,958,670
COMM 200	200	253,000	177,100
COMM 200	200	86,900	60,830
<b>Total</b>		<b>3,138,000</b>	<b>2,196,600</b>

6089  
 NEW BRITAIN, CT



**RECORD OF OWNERSHIP**  
 CONNECTICUT STATE OF-CCSU

BK-VOL/PAGE	SALE DATE	q/u	v/l	SALE PRICE	V.C.
	01/01/1900	U	V		

**PREVIOUS ASSESSMENTS (HISTORY)**

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2016	200	1,958,670	2015	200	1,958,670	2014	900	1,958,670
2016	200	177,100	2015	200	177,100	2014	900	177,100
2016	200	60,830	2015	200	60,830	2014	900	60,830
<b>Total:</b>		<b>2,196,600</b>	<b>Total:</b>		<b>2,196,600</b>	<b>Total:</b>		<b>2,196,600</b>

# City of New Britain

**Effective Revaluation: October 1, 2012**

**NOTES**

FKA 67 PAUL MANAFORT DR  
 CHARTER OAK COLLEGE  
 06-CORRECTED PAVING/LIGHTING  
 09-ACREAGE CHANGED BY GIS

**APPRAISED VALUE SUMMARY**

Appraised Bldg. Value (Card)	2,798,100
Total Appraised Parcel Value	3,138,000
Valuation Method:	C
<b>Net Total Appraised Parcel Value</b>	<b>3,138,000</b>

**BUILDING PERMIT RECORD**

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

**VISIT/CHANGE HISTORY**

Date	ID	Cd.	Purpose/Result
04/22/2009	MK	25	Inspection met 12-62
10/17/2007	RT	61	Field Review
10/01/2007	VA	61	Field Review

**LAND LINE VALUATION SECTION**

B Use # Code	Use Description	Zone	D Frontage	Depth	Units	Unit Price	L. Factor	S.A.	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	Land Value
1	901C CCSU MDL-94	S3	1698		2.72 AC	60,000.00	1.0000	F	1.00	104L	1.55			253,000
<b>Total Card Land Units: 2.72 AC Parcel Total Land Area: 2.72 AC</b>														<b>Total Land Value: 253,000</b>

**CONSTRUCTION DETAIL**

**CONSTRUCTION DETAIL (CONTINUED)**

Element	Code	Ch	Description	Element	Code	Ch	Description
Style	72		College/Univ				
Model	94		Comm/Ind				
Grade	10		B				
Stories	1						
Occupancy	1						
Exterior Wall 1	20		Brick/Masonry				
Exterior Wall 2							
Roof Structure	01		Flat				
Roof Cover	04		T&G/Rubber				
Interior Wall 1	05		Drywall				
Interior Wall 2							
Interior Floor 1	11		Ceram Clay Til				
Interior Floor 2							
Central Heat	01		Yes				
AC Type	01		None				
Bldg Use	901C		CCSU MDL-94				
Appl Units							
Total Bedrms	00						
Total Baths	0						
Comm Units							
Ind Units							
Heat/AC	00		None				
Frame Type	03		Masonry				
Baths/Plumbing	02		Average				
Ceiling/Wall	06		Cell & Walls				
Rooms/Prtns	02		Average				
Wall Height	10						
% Conn Wall	0						

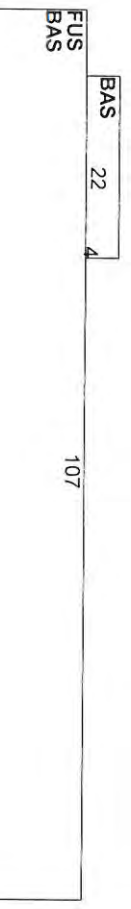
**OB-OUTBUILDING & YARD ITEMS(D) / XF-BUILDING EXTRA FEATURES(B)**

Code	Description	L/B	Units	Unit Price	Yr	Cnd	%Cnd	Appr Value
PAV1	Paving Asphalt	L	80,000	1.60	1994	A	60	76,800
LT2	Lights 2	L	6	2,800.00	1994	A	60	10,100

**BUILDING SUB-AREA SUMMARY SECTION**

Code	Description	Living Area	Gross Area
BAS	First Floor	7,298	7,298
FUS	Finished Upper Story	7,066	7,066

Ttl. Gross Liv/Lease Area: 14,364 14,364



**APPENDIX II**

**AERIAL PHOTOGRAPHS**





Proposed Parking Garage

55 Paul Manafort Drive

New Britain, CT 06053

Inquiry Number: 5027979.9

August 22, 2017

## The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

**Site Name:**

Proposed Parking Garage  
 55 Paul Manafort Drive  
 New Britain, CT 06053  
 EDR Inquiry # 5027979.9

**Client Name:**

Leggette, Brashears & Graham  
 4 Research Drive, Suite 204  
 Shelton, CT 06484  
 Contact: Michael Susca



Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

**Search Results:**

<u>Year</u>	<u>Scale</u>	<u>Details</u>	<u>Source</u>
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2008	1"=500'	Flight Year: 2008	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1996	1"=500'	Flight Date: April 22, 1996	CTMAGIC
1992	1"=500'	Acquisition Date: March 16, 1992	USGS/DOQQ
1990	1"=500'	Flight Date: April 19, 1990	MAGIC
1986	1"=500'	Flight Date: March 31, 1986	USGS
1972	1"=500'	Flight Date: May 12, 1972	USGS
1970	1"=500'	Flight Date: March 09, 1970	CTMAGIC
1965	1"=500'	Flight Date: April 01, 1965	USGS
1962	1"=500'	Flight Date: March 22, 1962	USGS
1957	1"=500'	Flight Date: May 29, 1957	CTMAGIC
1951	1"=500'	Flight Date: August 06, 1951	CTMAGIC
1941	1"=500'	Flight Date: October 13, 1941	USGS
1934	1"=500'	Flight Date: April 29, 1934	FAIR

**When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.**

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INQUIRY # 5027979.9

YEAR: 2012

— = 500'





INQUIRY # 5027979.9

YEAR: 2010

— = 500'





INQUIRY #: 5027979.9

YEAR: 2008

— = 500'



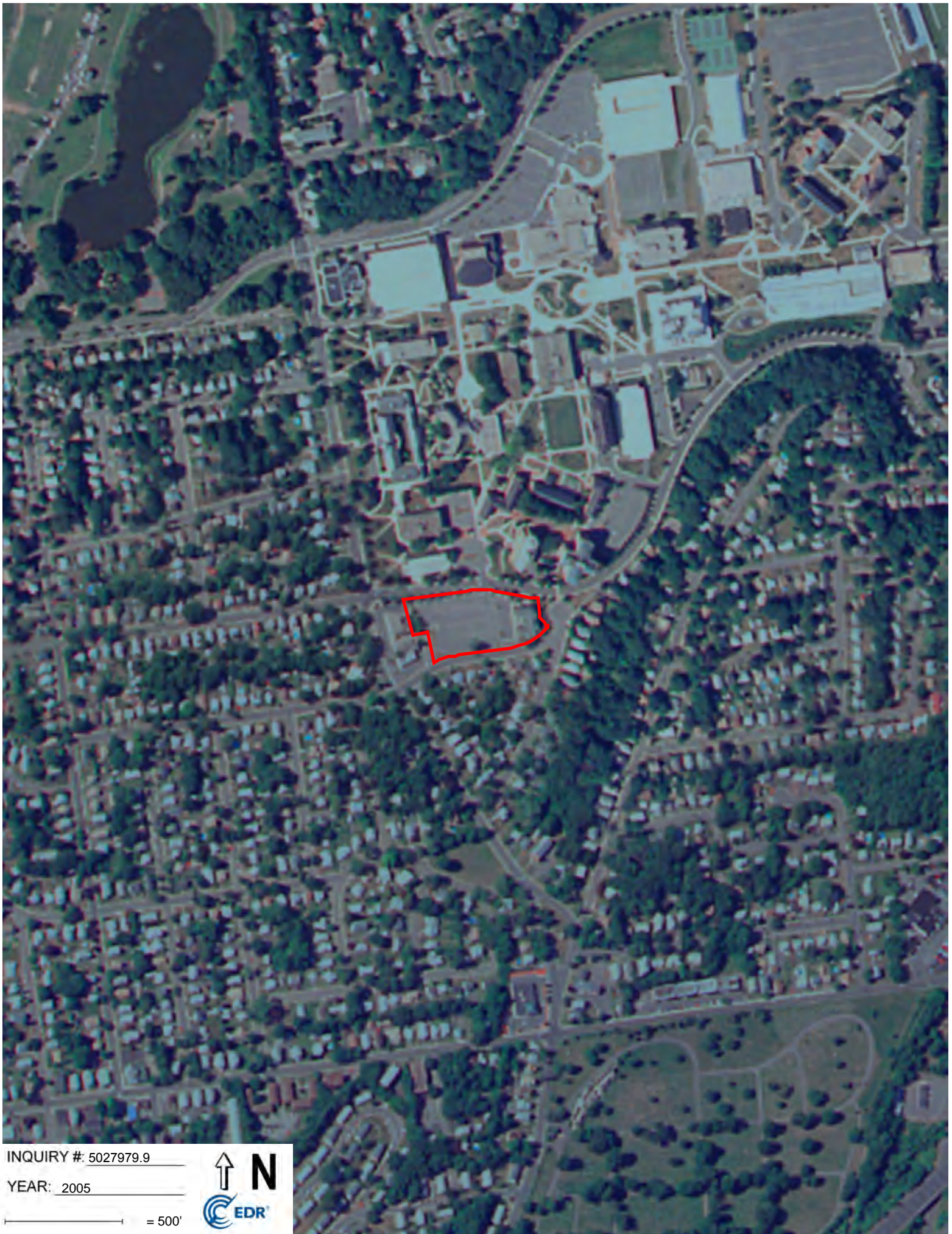


INQUIRY #: 5027979.9

YEAR: 2006

— = 500'





INQUIRY #: 5027979.9

YEAR: 2005

— = 500'





INQUIRY #: 5027979.9

YEAR: 1996

— = 500'







INQUIRY #: 5027979.9

YEAR: 1992

— = 500'





INQUIRY #: 5027979.9

YEAR: 1990

— = 500'



Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 5027979.9

YEAR: 1986

— = 500'



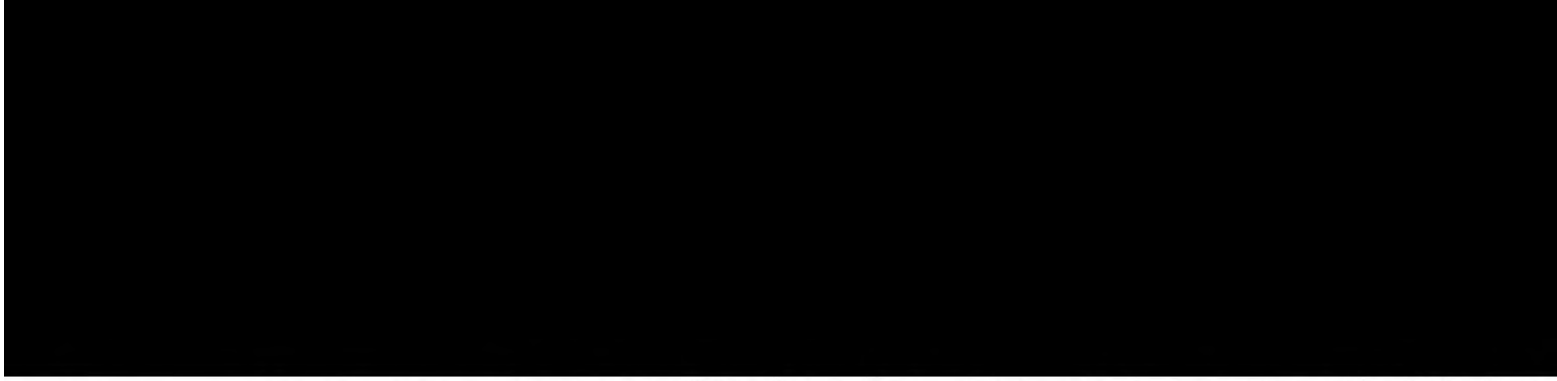


INQUIRY #: 5027979.9

YEAR: 1972

— = 500'





INQUIRY #: 5027979.9

YEAR: 1970

— = 500'





INQUIRY #: 5027979.9

YEAR: 1965

— = 500'





INQUIRY #: 5027979.9

YEAR: 1962

— = 500'





INQUIRY #: 5027979.9

YEAR: 1957

— = 500'







INQUIRY #: 5027979.9

YEAR: 1951

— = 500'





INQUIRY # 5027979.9

YEAR: 1941

— = 500'





INQUIRY #: 5027979.9

YEAR: 1934

— = 500'



**APPENDIX III**

**CITY DIRECTORIES**

**Proposed Parking Garage**

55 Paul Manafort Drive  
New Britain, CT 06053

Inquiry Number: 5027979.5  
August 22, 2017

# The EDR-City Directory Image Report

## TABLE OF CONTENTS

### SECTION

Executive Summary

Findings

City Directory Images

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

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## EXECUTIVE SUMMARY

### DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

### RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

<u>Year</u>	<u>Target Street</u>	<u>Cross Street</u>	<u>Source</u>
2013	L	L	Cole Information Services
2008	L	L	Cole Information Services
2003	L	L	Cole Information Services
1999	L	L	Cole Information Services
1995	oe	L	Cole Information Services
1992	oe	L	Cole Information Services
1985	oe	L	Johnson's City Directory
1976	oe	L	Price & Lee's City Directory
1972	oe	L	Price & Lee's City Directory
1968	oe	L	Price & Lee's City Directory
1964	oe	L	Price & Lee's City Directory

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## FINDINGS

### TARGET PROPERTY STREET

55 Paul Manafort Drive  
New Britain, CT 06053

Year

CD Image

Source

### PAUL MANAFORT DR

2013	pg A1	Cole Information Services	
2008	pg A5	Cole Information Services	
2003	pg A10	Cole Information Services	
1999	pg A14	Cole Information Services	
1995	-	Cole Information Services	Street not listed in Source
1992	-	Cole Information Services	Street not listed in Source
1985	-	Johnson's City Directory	Street not listed in Source
1976	-	Price & Lee's City Directory	Street not listed in Source
1972	-	Price & Lee's City Directory	Street not listed in Source
1968	-	Price & Lee's City Directory	Street not listed in Source
1964	-	Price & Lee's City Directory	Street not listed in Source



# FINDINGS

## CROSS STREETS

<u>Year</u>	<u>CD Image</u>	<u>Source</u>
<b><u>STANLEY ST</u></b>		
2013	pg. A2	Cole Information Services
2008	pg. A6	Cole Information Services
2003	pg. A11	Cole Information Services
1999	pg. A15	Cole Information Services
1995	pg. A19	Cole Information Services
1992	pg. A23	Cole Information Services
1985	pg. A26	Johnson's City Directory
1976	pg. A28	Price & Lee's City Directory
1972	pg. A31	Price & Lee's City Directory
1968	pg. A34	Price & Lee's City Directory
1964	pg. A37	Price & Lee's City Directory

## **STRATFORD RD**

2013	pg. A4	Cole Information Services
2008	pg. A9	Cole Information Services
2003	pg. A13	Cole Information Services
1999	pg. A18	Cole Information Services
1995	pg. A22	Cole Information Services
1992	pg. A25	Cole Information Services
1985	pg. A27	Johnson's City Directory
1976	pg. A29	Price & Lee's City Directory
1976	pg. A30	Price & Lee's City Directory
1972	pg. A32	Price & Lee's City Directory
1972	pg. A33	Price & Lee's City Directory
1968	pg. A35	Price & Lee's City Directory
1968	pg. A36	Price & Lee's City Directory
1964	pg. A38	Price & Lee's City Directory

## **City Directory Images**

**PAUL MANAFORT DR 2013**

55	STATE OF CONNECTICUT
89	ANTHONY FLORIAN
101	SHERREE SUTTON
109	JAMES COWANIEC
115	CHRISTOPHER RACKLIFFE IAN CRANSTON
145	OCCUPANT UNKNOWN
274	CHELSEA WOODS DEPAUL AVANT ELIZABETH KOMMRIEZ ERIC CHORNEY GRICELIA FELICIANO JASON DILLESBOW KEVIN BOOKER NATHANIEL SLATER WAYNE TWOMBLY
305	MICHAEL VINCI
315	OCCUPANT UNKNOWN
321	SUZANNE GANEM
329	OCCUPANT UNKNOWN

**STANLEY ST 2013**

1402	STEPHAN WELLS
1403	BENJAMIN VINCI
1411	HARTFORD CHRI
1425	OCCUPANT UNKNOWN
1431	JOZEF STARCZEWSKI
1443	LOUISE LANG
1447	ROBERT HART
1450	BRYAN MERRITT
1456	ROLAND CARTER
1462	DEBORAH TOCONIS
1469	PETER KULCZYK
1474	JON ZIPADELLI
1475	JAMES ABELY
1479	HELEN CARR
1484	EDWARD TOWNSEND
	GAY BELLARO
	JENNY WIENER
1487	BRANDON REED
1493	CHRISTOPHER NOBLE
1494	CALVIN WHITE
1497	TIMOTHY FAGAN
1498	THEREA JONES
1504	JESON HGHUS
1517	FLYING TIGER TATTOO
	QUICK & EASY
1523	DOMINOS PIZZA
	HONG KONG CHINESE RESTAURANT
	OCCUPANT UNKNOWN
	RAZOR SHARP
1524	MELISSA GONZALES
1528	GUY CRUNDWELL
1535	CENTRAL CUTS PLUS
	UNDERGROUND DELI
1537	BLIMPIE SUB SANDWICHES
	DUNKIN DONUTS
	GIUSEPPINA KONDERLA
	GREEN MASSAGE
	HOUSE OF KABOB THE
	STANLEYS SEWER & DRAINS
	SUBWAY SANDWICHES
	TONYS CENTRAL PIZZA
1544	MAXINE PRICE
1556	HAROLD RODRIGUEZ
1564	ELECTROLOGY ASSOCIATES OF NEW BRITAI
	PETER MIANO
1568	BEDDOWS MALERY
1576	DEBORAH KRACZKOWSKY
1584	DWIGHT BLINT
1590	NELSON CASTANEDA
1600	GEORGE BALKUN

**STANLEY ST      2013      (Cont'd)**

1600	PAUL DUCHARME
1614	GYONG KIM
1615	BARNES & NOBLE
	CENTRAL CONNECTICUT STATE UNIVERSITY
	STATE OF CONNECTICUT
1620	ANN MIKLOS
1626	OCCUPANT UNKNOWN
	VALENTI PHINEHAS & REBECCA PIANO INS
1634	JOHN CATENZARO
1646	VARTKES ATASHIAN
1654	PATRICK HUNTLEY
1664	NICOLA CULTRERA
1707	GETTY GAS
1719	CRAIG SCHMITT
1721	TAMMY JENNINGS
1755	ST FRANCIS OF ASSISI CHURCH
1757	ST FRANCIS OF ASSISI CONVENT
1771	MARK DIORIO
1777	PATRICIA LYNCH
1785	CHRISTOPHER RYBA
1795	JOEY CARVER
1803	FRANK CUOMO
1813	GREGORY FALLA
1837	MICHAEL GIBEAU
1843	JAMES PIERCE
1849	DENG SISAVATH
1855	BENJAMIN BAIRD
1863	OCCUPANT UNKNOWN
1867	XUESONG CHEN
1883	MARION MOTTA
1886	NICHOLAS SABATINO
1891	EDWARD LYNCH
1894	MARY OBRIEN
1897	OCCUPANT UNKNOWN
1901	JOSEPH GIACALONE

**STRATFORD RD 2013**

17	LINDA CMUCHOWSKI
22	FLORENCE TARDIF
26	JOSEPH ROSATI
32	C CHERRY
36	JANICE DELGADO
42	CONCETTA LOPES
48	JOHN ESTEY
75	D WOJA
125	NICOLA GUCCI
126	STEPHANIE SOUSA
128	MATT NORRIS
130	THERESA SHEREMETA
131	THOMAS HAMMERSCHMID
134	MATT MCGARRY
137	SEAN DUGAS
141	HENRY GRECZKOWSKI
145	MICHAEL BELOIN
147	LYNN LEAVITT
152	SEAN RIVERS
	WILLIAM KINIRY
155	MICHAEL TEREZAKIS
158	GLORIA HAMPL
161	JOHN NEDOSKO
164	MICHAEL REVZON
170	OCCUPANT UNKNOWN
175	JASON BROWN
179	BYUNG MIN
182	MARK KONARSKI
187	PETER EDDY
188	GIUSEPPE DEDONA
193	JUNE MICHALS
194	OMRI AYALON
199	DEREK PETROKA
200	COLLEEN MCDERMOTT
205	MATTHEW SKWIOT
213	DOMINIQUE DORCE
215	RICHARD POPHAM
216	ALEXANDER GARY
219	CAROL MCGILL
225	LARRY GALLUPE
230	GREGORY YASURA
231	DONA BLAZUK

**PAUL MANAFORT DR 2008**

55	BOARD FOR STATE ACDMC AWRDS CHARTER OAK STATE COLLEGE EDUCATION CT STATE DEPT OF
89	KANE KHAMPHOUVONG
95	AMMA OSAFO JUDITH BADRIGIAN LAURIE ZEMBKO
101	KEJUAN DILLARD
109	OCCUPANT UNKNOWN
115	DIANE MARTINO K OROURKE KATIE DARROW LAN CRANSTON S DANDREA S FLANAGAN T COSTA
145	OCCUPANT UNKNOWN
274	ANDREW THORP CALEB NEVES DAVID TYRIE HECTOR REYOSO J MORIARTY JASON DILLESBOW JENNIFER HAMEL KARINA GALARAZA MANII STEPHENSON N ALLEGRO
305	JUAN NADAL
315	MATT WISNIEWSKI
321	KATHRYN ELLIS MITCHELL GRAHAM SUZANNE GANEM
329	AARON ZONONI

**STANLEY ST 2008**

1402 STEPHAN WELLS  
 1403 GERTRUDE MALCYNISKY  
 1411 HARTFORD CHRI  
 1425 AWAD FUDL  
 FATIN MOHAMEDALI  
 1431 JOZEF STARCZEWSKI  
 1443 LANG LANDON  
 LOUISE LANG  
 1447 ROBERT HART  
 1450 DONNA MERRITT  
 1456 RO EL MUSIC PRODUCTIONS  
 ROLAND CARTER  
 1462 OCCUPANT UNKNOWN  
 1469 POLISH BOOKS  
 SEBASTIAN KULCZYK  
 1474 RICHARD ALLEN  
 1475 JONAS SACHARKO  
 KAREN LAFLAND  
 1479 FILIPPOS MILIOS  
 1484 EDWARD TOWNSEND  
 JON ZIPADELLI  
 L ANDREWS  
 1487 BRANDON REED  
 1493 CHRISTOPHER NOBLE  
 MANOJ PATEL  
 NOBLE & ASSOCIATES LLC  
 1494 OCCUPANT UNKNOWN  
 1497 JEFFREY WIGHT  
 1498 THEREA JONES  
 1504 JON ZIPADELLI  
 1517 CENTRAL CUTS PLUS LLC  
 VUPS LLC  
 1523 DOMINOS PIZZA  
 OCCUPANT UNKNOWN  
 1524 OCCUPANT UNKNOWN  
 1528 GUY CRUNDWELL  
 1535 ANOTHER BOOKSTORE LLC  
 THE UNDERGROUND DELI  
 1536 RUTH RUBENSTEIN  
 1537 ACE OF SPADES  
 ANTON INC  
 SNOT LOCKER  
 TONY'S CENTRAL PIZZA  
 WHOLE DONUT  
 1544 ROXANNE CHANCE  
 1556 MARIA RODRIGUEZ  
 1564 ELECTROLOGY ASSOCS NEW BRITAIN  
 PETER MIANO  
 1568 BEDDOWS MALERY  
 1576 MARILYN KRACZKOWSKY



**STANLEY ST      2008      (Cont'd)**

1584	DWIGHT BLINT
1590	NELSON CASTANEDA
1600	LOUISE BALKUN R TAYLOR
1614	OCCUPANT UNKNOWN
1615	CCSU FOUNDATION INC CENTRAL CONNECTICUT CHARTWELLS COMPASS GROUP USA INC UNIVERSITY OF CONNECTCT INC WFCS FM
1620	SANDRA SANTOS
1626	OCCUPANT UNKNOWN
1634	JOHN CATENZARO
1646	VARTKES ATASHIAN
1650	BARRY ARPAIA
1654	DAVID HAMES
1664	JOSEPH SANZO LANE LANDON
1707	SAMS GETTY
1719	CRAIG SCHMITT
1721	TAMMY JENNINGS
1755	RICHARD DONOVAN SAINT FRANCIS OF ASSISI CHURCH
1757	DENISE MURPHY SAINT FRANCIS OF ASSISI CONVENT SAINT FRANCIS OF ASSISI MIDDLE SCHOO SRS OF NOTRE DAME WILTON PRVNCE OF SCHOOL SISTERS
1771	DIORIO CONCRETE MARK DIORIO
1777	PATRICIA LYNCH
1785	CHRISTOPHER RYBA
1791	ROBERT GAFFNEY
1795	JOEY CARVER
1803	FRANK CUOMO
1813	GREGORY FALLA TYPE ONE DIABETES ASSISTANCE & ENL
1837	NICOLE GIBEAU
1843	JAMES PIERCE
1849	DENG SISAVATH
1855	CHARLES SMITH
1863	CHRISTOPHER COYLE
1867	BERNICE GRANT
1883	MARION MOTTA
1886	TRACIE SPINGARN
1891	EDWARD LYNCH
1894	MARGARET FLOOD
1897	DIX KELLY
1901	JOSEPH GIACALONE

Target Street

Cross Street

Source

-

✓

Cole Information Services

**STANLEY ST**

**2008**

**(Cont'd)**

1904 DEBORAH JAMES

## STRATFORD RD 2008

17	LINDA CMUCHOWSKI
22	GERARD TARDIF
32	ROBERT COGAN
36	JOSEPHINE CAMARATA
42	CONCETTA LOPES
48	JOHN ESTEY
75	D WOJA
124	GARY SASSO
	GREG BALEK
	JAMES MACCHIO
	ROBERT WILSON
125	AMERICAN FUNDRAISING LLC
	STEPHEN WICKE
126	KRISTINA PEATT
128	BRIAN FITZGERALD
	LESLIE GIACCO
	M BERLINSKI
130	REBECCA KLITZNER
131	WALTER LIZON
134	JON ZIPADELLI
137	JENNIFER VESCOGNI
141	HENRY GRECZKOWSKI
145	TRACY MAKAY
147	ROBERT LEAVITT
152	MARY KINIRY
	WILLIAM KINIRY
155	MICHAEL TEREZAKIS
158	GLORIA HAMPL
161	ANDREW NEDOSKO
	J STEPHEN & CO
164	MICHAEL REVZON
169	KRISTINE LEWKO
170	OCCUPANT UNKNOWN
175	JENNA OCCHIALINI
179	DAVID MACKENZIE
182	RICHARD ZINK
187	PETER EDDY
188	RICH KINGSBURY
193	JUNE MICHALS
194	MICHAL AYALON
199	JOHN PETROKA
200	COLLEEN MCDERMOTT
205	PAULINE SKWIOT
213	NORA TOMASSO
215	RICHARD POPHAM
216	ALEXANDER GARY
219	CAROL MCGILL
225	LARRY GALLUPE
230	GREGORY YASURA
231	DONA BLAZUK

**PAUL MANAFORT DR 2003**

55	CHARTER OAK STATE COLLEGE
89	KANE KHAMPHOUVONG
101	SCOTT RICHARDSON
109	ALFRED CURRAN
115	K OROURKE T COSTA
145	OCCUPANT UNKNOWN
274	ADAM PALLONE AKI UCHIDA ALICIA MCKNIGHT ANDRE DOWNES ANESDO LLC B KAGAN COLLEEN STEWART DONNA DUBE GUY CRUNDWELL JASON DILLESBAY JENNIFER HAMEL JOHN FRAZIER JULIUSZ KOSTECKI KEVIN BOOKER KEVIN QUINN LAURA CURRIER MATTHEW RENNIE NATHAN MEADE NEIL VANE PATRICK SELLERS SARA WATERS
305	ANDREW DAIGLE
309	LESLIE GIACCO
315	OCCUPANT UNKNOWN
321	ALI TATARI GILBERT DEROSIER JOSEPH GORNEAULT MITCHELL GRAHAM
329	OCCUPANT UNKNOWN

**STANLEY ST 2003**

1402 STEPHAN WELLS  
 1403 GERTRUDE MALCYNISKY  
 1417 BETHEL ALLIANCE CHURCH  
 CHRISTIAN & MISSIONARY EL SHD  
 1425 EVELYN RUSSO  
 FATIN MOHAMEDALI  
 NADIA ABDELEASST  
 1443 LOUISE LANG  
 1447 ROBERT HART  
 1450 DONNA MERRITT  
 1456 DAMON CARTER  
 1469 CARE OF CONNECTICUT INC  
 PIOIR KULCZYK  
 1475 KAREN LAFLAND  
 1479 M HAROUTUNIAN  
 1487 KAREN REED  
 1493 1493 STANLEY LLC  
 1497 MARK MOONEY  
 1517 QUICK N EASY LLC  
 1523 HONG KONG CHINESE RESTAURANT  
 OCCUPANT UNKNOWN  
 1524 TAYLOR AMAIO  
 1528 JODY BARR  
 1535 RINALDOS HAIR SALON  
 THE OTHER BOOKSTORE  
 1536 RUTH RUBENSTEIN  
 1537 ANTON INC  
 BLIMPIE SUBS & SALADS  
 TONY'S CENTRAL PIZZA  
 WHOLE DONUT NEW BRITAIN  
 1544 OCCUPANT UNKNOWN  
 1547 JOE BEAN CAFE LLC  
 1556 MARIA RODRIQUEZ  
 WILSON RODRIGUEZ  
 1564 PETER MIANO  
 1568 GINA FONSECA  
 1576 MARILYN KRACZKOWSKY  
 1590 NELSON CASTANEDA  
 1600 LOUISE BALKUN  
 1614 HELEN ODAY  
 1615 CENTRAL CNCTT STATE UNVRSTY  
 CENTRAL CONNECTICUT STATE  
 UNIVERSITY OF CONNECTCT INC  
 1620 ANN MIKLOS  
 1626 VALENTI PHINEHAS & REBECCA PNO  
 1634 JOHN CATENZARO  
 1646 VARTKES ATASHIAN  
 1650 BARRY ARPAIA  
 1654 DAVID HAMES  
 1664 CULTRERA REMODELING

**STANLEY ST      2003      (Cont'd)**

1664 M EWART  
1721 ANIELA WDOWIAK  
1755 RICHARD DONOVAN  
1757 DENISE MURPHY  
SCHOOL SISTERS OF NOTRE DAME  
ST FRANCIS OF ASSISI CONVENT  
1771 PATRICIA DIORIO  
1777 PATRICIA LYNCH  
1785 EUGENE RYBA  
1795 JOEY CARVER  
1803 FRANK CUOMO  
1813 GREGORY FALLA  
TYPE ONE DIABETES ASSISTANC  
1837 PAUL GIBEAU  
1843 JAMES PIERCE  
1849 PENG SISAVATH  
1855 CHARLES SMITH  
1867 BERNICE GRANT  
1883 MARION MOTTA  
1886 MELISSA HAWKINS  
1891 EDWARD LYNCH  
1894 P FLOOD  
1897 JOYCE KELLY  
1901 JOSEPH GIACALONE  
1904 YOHIL PIZARRO

## STRATFORD RD 2003

22	GERARD TARDIF
32	ROBERT COGAN
36	LOUIS CAMARATA
42	CONCETTA LOPES
48	OCCUPANT UNKNOWN
124	GARY SASO
	GARY SASSO
	GREG BALEK
125	STEPHEN WICKE
126	ALYSON ROBICHAUD
128	M BERLINSKI
130	JESSICA TUCKER
134	JEANINE BERASI
137	WILLIAM DUNN
141	HENRY GRECZKOWSKI
145	JAMES TREANOR
147	ROBERT LEAVITT
152	EDWARD RYSZKIEWICZ
	ROSE PREVITI
155	MICHAEL TEREZAKIS
158	GLORIA HAMPL
161	ANDREW NEDOSKO
	STEPHEN J CO
164	MICHAEL REVZON
169	PAUL LEWKO
170	VINCENT CMUCHOWSKI
175	LUCILLE BANNON
179	DAVID MACKENZIE
182	RICHARD ZINK
187	SPENCER TORELL
188	COLETTE KINGSBURY-RICH
193	JUNE MICHALS
194	ARAN AYALON
199	JOHN PETROKA
200	COLLEEN MCDERMOTT
205	PAULINE SKWIOT
213	NORA TOMASSO
215	CHRISTOPHER MCLEAN
216	ALEXANDER GARY
219	CAROL MCGILL
225	LARRY GALLUPE
230	JERZY WISZOWATY

**PAUL MANAFORT DR 1999**

89	JAMES KARAM
95	SCOTT HURD
101	OCCUPANT UNKNOWN
109	ALFRED CURRAN
115	MELISSA ZULLO
274	BARRY WESTCOTT
	CRAIG WHALEN
	DEBORAH APPELLE
	DEBRA MARSLAND
	K YOERKIE
	NICOLE BURNHAM
	WILLIAM COLOGNE
305	SEAN CONWAY
309	OCCUPANT UNKNOWN
315	N GRUTTADAURIA
321	GILBERT DEROSIER
	J GORNEAULT



## STANLEY ST      1999

1395	CARL FAUNCE L ROUTHIER MARTIN GAUTHIER
1402	OCCUPANT UNKNOWN
1403	JAY MALCYNKY
1417	BETHEL ALLIANCE CHURCH
1425	V MEZA
1431	JOZEF STARCZEWSKI
1437	OCCUPANT UNKNOWN
1443	LOUISE LANG
1447	ROBERT HART
1450	OCCUPANT UNKNOWN
1456	DAMON CARTER
1462	OCCUPANT UNKNOWN
1467	OCCUPANT UNKNOWN
1469	DARREL QUALLS SCOTT WELLS
1475	KARNE LAFLAND
1479	OCCUPANT UNKNOWN
1484	ANTHONY CARDOSO DORIS ZUROWSKI EUGENE LEACH
1487	CHARLES PARSONS
1493	KEN COPELAND M SWIDRAK
1496	OCCUPANT UNKNOWN
1497	MARY ORME OSCAR CABO TRACEY KINNEY
1504	JOSE MORANT
1517	QUICK N EASY
1523	ALLSTATE INSURANCE COMPANIES SALES OFFICES OCCUPANT UNKNOWN ORIENTAL EXPRESS CHINESE RESTAURANT
1524	P AMAIO
1527	HAINES IRENE INS
1535	OTHER BOOK STORE THE
1536	SAUL RUBENSTEIN
1537	BELVEDERE DENTAL ASSOCIATES BLIMPIE SUBS & SALADS MALON CAROLYN J DDS MORAN STEPHEN M DDS TONYS CENTRAL PIZZA WHOLE DONUT NEW BRITAIN THE
1544	OCCUPANT UNKNOWN
1547	RINALDOS HAIR SALON
1556	BETTY HANDSHAW E KOHUT J SHELLMAN JAMES PYNE

## STANLEY ST      1999      (Cont'd)

1556	SUSANNE HANSHAW
1564	BARBARA POLUBINSKI
1568	HEATHER ONEILL
1584	ABRAHAM KOLODNEY
1590	JON DAIGLE
1600	CHARLES CARROLL
	JOHN BALKUN
1614	WILLIAM ODAY
1615	AMER ASSOCIATE OF PROFS STATE UNIVERSITY
	CENTRAL CONNECTICUT STATE UNIVERSITY
	CONNECTICUT STAT OF CTRL CONNECTICUT STAT UNIVERSI
	CONNECTICUT STAT OF CTRL CONNECTICUT STAT UNIVERSITY
	CONNECTICUT STATE UNIVERSITY
1620	JOSEPH MIKLOS
1626	P CALENTI
	VALENTI PHINEHAS & REBECCA PNO INSTRUCTION & TUNI
1634	JOHN CATENZARO
1646	MARY ATASHIAN
1654	LISA KALISZ
1658	OCCUPANT UNKNOWN
1664	CULTRERA REMODELING
	JULIE CULTRERA
1719	CRAIG SCHMITT
	E MICHALOWSKI
1721	ANIELA WDOWIAK
1755	RICHARD DONOVAN
	ST FRANCIS OF ASSISI CHURCH
1756	OCCUPANT UNKNOWN
1757	SCHOOL SISTERS OF NOTRE DAME
	ST FRANCIS OF ASSISI CONVENT
1771	P DIORIO
1772	OCCUPANT UNKNOWN
1775	OCCUPANT UNKNOWN
1777	P LYNCH
1785	C RYBA
1791	ROBERT GAFFNEY
1795	JOEY CARVER
1803	FRANK COUMO
1813	GREG FALLA
1814	OCCUPANT UNKNOWN
1837	PAUL GIBEAU
1843	OCCUPANT UNKNOWN
1849	G WEINBERGER
1855	DAVID SMITH
	STRATFORD SPECIALTIES LLC
1863	WILLIAM COYLE
1867	BERNICE GRANT
1883	MIKE MOTTA
1886	S CAPPS
1891	EDWARD LYNCH

Target Street

Cross Street

Source

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Cole Information Services

**STANLEY ST**

**1999**

**(Cont'd)**

1894 P FLOOD  
1897 LARA KELLY  
1901 JOSEPH GIACALONE

**STRATFORD RD 1999**

22	WALTER ZMITRUK
32	ROBERT COGAN
36	LOUIS CAMARATA
41	OCCUPANT UNKNOWN
42	C LOPES
125	MICHAEL PRIOR
128	SANDRA BOOTH
	THOMAS JARZABEK
130	K DUDZINSKI
	WILLIAM WALTON
131	WALTER LIZON
134	THERESA OTFINOWSKI
137	JOHN BABA
141	ROBERT HUNT
145	FRANK CARDOSO
147	LYNN LEAVITT
152	J RYSZKIEWICZ
	ROSE PREVITI
155	MICHAEL TEREZAKIS
158	GLORIA HAMPL
161	JOHN NEDOSKO
164	MICHAEL REVZON
166	OCCUPANT UNKNOWN
169	PAUL LEWKO
170	VINCENT CMUCHOWSKI
175	OCCUPANT UNKNOWN
179	SOPHIE MACKENZIE
182	RICHARD ZINK
187	SPENCER TORELL
193	JUNE MICHALS
194	JOHN LARKIN
199	JOHN PETROKA
200	OCCUPANT UNKNOWN
205	PAULINE SKWIOT
213	NORA TOMASSO
215	CHRIS MCLEAN
216	A GARY
219	MARTIN MCMULLEN
225	LARRY GALLUPE
230	BOZENA STRACHAN

## STANLEY ST      1995

1395	OCCUPANT UNKNOWNN
1402	WELLS, STEPHAN J
1403	MALCYNISKY, JOSEPH
1417	BETHEL ALLIANCE CHURCH
1425	PATTENAUDE, DYLAN RUSSO, JOSEPH J
1431	STARCZEWSKI, JOZEF
1443	LANG, JOSEPH
1447	HART, SUE
1450	OCCUPANT UNKNOWNN
1456	DAVIS, KENNETH C
1462	OSULLIVAN, CHARLES R
1469	EISEMANN, BERND MCGOWAN, JUDITH TRITT, SCOTT A WELLS, SCOTT
1475	POGLITSCH, JOHN F
1479	OCCUPANT UNKNOWNN
1484	LEACH, EUGENE F PETRINI, J K ZUROWSKI, DORIS
1487	OCCUPANT UNKNOWNN
1493	CARRIERO, WAYNE KOZACZKA, LAURA MOSHER, MICHELE
1497	FULLER, ED GERVAIS, J PIEPER, J TREFF, THOMAS TYLER, KIM WOLFEL, KEN
1504	MORANT, JOSE R SR
1517	SULLO, JOSEPH A WAWA FOOD MARKET
1523	RUSH TYPING CENTER
1524	AMAIO, P A
1527	ORIENTAL EXPRESS
1528	OCCUPANT UNKNOWNN
1535	BLIMPIE OTHER BOOK STORE
1536	RUBENSTEIN, SAUL
1537	BELVEDERE DENTAL ASSOC KOZIURA INSURANCE NATIONWIDE TRAVEL AGENCY STEPHEN M MORAN DDS TONYS CENTRAL PIZZA WHOLE DONUT
1544	OCCUPANT UNKNOWNN
1556	ROSE, DAVID A SHELLMAN, J

**STANLEY ST      1995      (Cont'd)**

1568	GRAHAM, C
1576	OCCUPANT UNKNOWNN
1584	KOLODNEY, ABRAHAM J
1590	KIRCHLECHNER, E
	LAGONIGRO, PAUL
	VIERECK, B
1600	BALKUN, JOHN JR
	RENNIE, MATTHEW L
1614	ODAY, WILLIAM J
1615	AAUP CONN STATE UNIVERSITY
	BUMPUS, WILLIAM
	CENTRAL CONNECTICUT STATE UNIV
	CENTRAL CT ST UNIV
	CENTRAL RECORDER NEWSPAPER
	DAKA FOOD SVC
	DAKA INC
	DONNA, CARNEY
	LENNON, KRISTEN
	MCMAHON, KERRI
	OLIVA, KEVIN
	OVERBYE, JILL
	POIRIER, ALAN
	TULLY, JOHN
	WFCS
1620	MIKLOS, JOSEPH C
1626	VALENTI SCHL PIANO/ORGAN
1634	CATENZARO, JOHN
1646	ATASHIAN, VARTKES
	HERRICK, E
1650	DORBUCK, ANTHONY A
1664	MORA, S E
1719	SCHMITT, FRANK J SR
1721	WDOWIAK, ANIELA
1755	SAINT FRANCIS OF ASSISI CHR
1757	SAINT FRANCIS ASSISI CONVENT
1771	DIORIO, P
1777	LYNCH, P A
1785	RYBA, C B
1791	GAFFNEY, ROBERT P
1795	RASCOE, HARRY
1803	BOURRET, REBECCA
	KINNEY, JEFFREY
1837	GIBEAU, PAUL E
1843	PIERCE, JAMES
1855	SMITH, DAVID
1863	COYLE, WILLIAM B
1867	OCCUPANT UNKNOWNN
1883	MOTTA, MIKE
1886	KOROPSAK, JULIUS
1891	LYNCH, EDWARD T JR

Target Street

Cross Street

Source

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Cole Information Services

**STANLEY ST**

**1995**

**(Cont'd)**

1894 FLOOD, P C  
1904 BUTTERO, MICHAEL  
1910 HOLY RESURRECTION ARMENIAN CHR

**STRATFORD RD 1995**

22	ZMITRUK, WALTER
32	OCCUPANT UNKNOWNN
36	CAMARATA, LOUIS A
42	LOPES, C M
124	GOUTHRO, MARK
	MOSHIER, J
	NEIDLINGER, MELANIE
	OBAR, J
	OWEN, LES
125	PRIOR, PAUL
128	OCCUPANT UNKNOWNN
130	BALL, ARTHUR JR
	LYNN, ABBI
131	LIZON, WALTER
134	OTFINOWSKI, THERESA
137	SPRAGUE, M H
141	GRECZKOWSKI, HENRY E
145	MCNIFF, MICHAEL
147	LEAVITT, LYNN
152	GARRITY, MARY
	PREVITI, ANTHONY
155	OCCUPANT UNKNOWNN
161	J STEPHEN & CO
	NEDOSKO, JOHN S JR
164	REVZON, MICHAEL
169	OCCUPANT UNKNOWNN
170	CMUCHOWSKI, VINCENT G
179	MACKENZIE, SOPHIE
182	ZINK, RICHARD J
187	TORELL, SPENCER P
188	RICH, COLETTE K
194	LARKIN, JOHN
199	PETROKA, JOHN J
200	HERMES, DON
205	SKWIOT, PAULINE L
213	TOMASSO, NORA F
215	HEDENBERG, DAVID N
216	GARY, A
219	LARSON, BRAD
225	GALLUPE, LARRY
230	KITCHING, ELAINE
231	BOUDREAU, IRVIN G



**STANLEY ST 1992**

1395 BALL, STEVEN  
 WALSH, PATTY  
 1402 HOGAN, MOJO J  
 1403 MALCYNKY, JOSEPH  
 1417 BETHEL CHURCH  
 1425 RUSSO, JOSEPH J  
 1431 STARCZEWSKI, JOZEF  
 1443 LANG, JOSEPH  
 1447 HART, SUE  
 1456 DAVIS, KENNETH C  
 1462 OSULLIVAN, CHARLES R  
 1469 WELLS, SCOTT W  
 1475 POGLITSCH, JOHN F  
 1479 HAROUTUNIAN, HARRY  
 1484 LEACH, EUGENE F  
 PURCARO, TODD M  
 1493 COVE PT CORP  
 1497 BRUNO, D  
 GROOM, JEFFREY  
 MCKAY, T  
 WOLFEL, KEN  
 1504 MORANT, JOSE R SR  
 1517 WAWA FOOD MARKET  
 1523 KINKOS  
 KINKOS COPIES  
 1528 SNYDER, LYNNE  
 1535 OTHER BOOK STORE  
 1536 RUBENSTEIN, SAUL  
 1537 BELVEDERE DENTAL  
 KOZIURA INSURANCE  
 MALON C J DDS OFC  
 MODA REY SALON  
 MORAN STEPHEN M DDS  
 NATIONWID TRAVEL  
 T C B Y  
 TONY'S CENTRAL PIZZA  
 WHOLE DONUT  
 1556 SHELLMAN, J  
 1576 KRACZKOWSKY L H DR  
 1584 KOLODNEY, ABRAHAM J  
 1590 DAIGLE, JON  
 1600 BALKUN, JOHN JR  
 PAYTON, JASON  
 1614 ODAY, WILLIAM J  
 1615 ARA SLATER SCH & CLG  
 ARA SLATER UNION  
 CENTRAL CONNCT UNIV  
 NATIONAL CENTER  
 ST CENTRAL CT UNIV  
 STRONG CONTRACT CLN

**STANLEY ST 1992 (Cont'd)**

1615	W F C S
1620	MIKLOS, JOSEPH C
1626	VALENTI SCHL PIANO
1634	CATENZARO, JOHN
1646	ATASHIAN, VARTKES
1650	DORBUCK, ANTHONY A
1664	MORA, S E
1719	SCHMITT, FRANK J SR
1755	ST FRANCIS CHURCH
1757	SCHOOL SISTERS
	ST FRANCIS CONVENT
1771	DIORIO, P
1777	LYNCH, P A
1791	GAFFNEY, ROBERT P
1792	NEILL, HILDA
1795	RASCOE, HARRY
1803	BOURRET, REBECCA
	KINNEY, JEFFREY
1837	GIBEAU, PAUL E
1843	PIERCE, J
1855	SMITH, DAVID
1863	COYLE, WILLIAM B
1867	GIBEAU, MICHAEL
1883	MOTTA, MIKE
1886	BUDNICK, S
	LAPINSKI, K
1891	DOMIN, ROBERT F
	LYNCH, EDWARD T JR
1894	FLOOD, P C
1904	BUTTERO MICHAEL REV
	BUTTERO, MICHAEL

**STRATFORD RD 1992**

22	ZMITRUK, WALTER
32	BLOT, A D
36	CAMARATA LOUIS A CAMARATA, LOUIS A
42	LOPES, ANTHONY
124	PROVOST, JEFF WATSON, MARIA
125	PRIOR, PAUL
130	BALL, ARTHUR JR SROKA, SALLY A
131	LIZON, WALTER
134	OTFINOWSKI, THERESA
137	SPRAGUE, M H
141	HUNT, ROBERT
145	MCNIFF, MICHAEL T
147	LEAVITT, LYNN
152	GARRITY, MARY PREVITI, ANTHONY
155	MESKILL, JOHN
161	NEDOSKO, JOHN S JR STEPHEN J & CO
164	REVZON, MICHAEL
169	LEWKO, JOHN
170	CMUCHOWSKI, VINCENT G
179	MACKENZIE, SOPHIE
182	ZINK, RICHARD J
187	TORELL, SPENCER P
194	LARKIN, JOHN
199	PETROKA, JOHN J
200	HERMES, DON
205	SKWIOT, STANLEY S
213	TOMASSO, ELLEN
215	HEDENBERG, DAVID N
216	GARY, A
219	MCMULLIN, MARTIN E
225	GALLUPE, LARRY
230	KITCHING, H A
231	BOUDREAU, IRVIN G
1242	HENDRICKS, ERIC J

## STANLEY ST 1985

1214	KROL K.....	225-9937	1517	WAWA FOOD MARKET.....	223-0775
1214	SASIELA A M.....	827-1729	1524	AMAIO Philip A@.....	223-6667
1214	WELK Elizabeth J.....	224-7324	1528	SNYDER Lynn E Dr@.....	225-2311
1218	BARRY Clark F@.....	224-3427	1529	No Information.....	
1218	BILODEAU Felix C.....	827-1894	1536	MUSSMAN Merton.....	229-7435
1218	MARKHAM James J.....	223-6473	1536	RUBENSTEIN Saul@.....	229-7435
1218	SECKLA Joseph J Jr.....	225-0470	1543	BELVIDERE BARBER SHOP.....	223-1700
1218	SHAMMAS Robert.....	229-1295	1543	GRAND CENTRAL'S STATION.....	224-9190
1218	SLOWEY Richard P.....	224-4600	1544	LOGIUDICE Sal V.....	827-1263
1218	(#102)KONICKI Joseph.....	229-9871	1544	RACKLIFFE Tina.....	827-1263
1222	GAJDA P.....	827-9780		<b>FRANCIS ST CROSSES</b>	
1222	HENSLEY William L.....	224-2569	1556	PYNE James E@.....	229-4773
1222	KAZKNOVSKI D E.....	827-0719	1556	SHELLMAN Juliette.....	229-1875
1222	MELLEN Nancy A.....	224-3666	1556	SHELLMAN Richard.....	229-1875
1222	(#202)NOWAK Clara J.....	224-8150	1564	No Information.....	
1230	No Information.....		1568	DAIGLE Jon.....	223-8388
1232	KENNEDY Michael B.....	223-4619	1576	KRACZKOWSKY David.....	229-2346
1232	KENNEDY Ruth M.....	223-4619	1576	KRACZKOWSKY Thomas.....	229-2346
1234	No Information.....		1576	(ofc)KRACZKOWSKY LESTER H DR.....	225-3693
1236	No Information.....		1576	(res)KRACZKOWSKY Lester H Dr@.....	229-2346
1238	No Information.....		1584	KOLODNEY Abraham J@.....	229-4500
1242	No Information.....		1590	No Information.....	
1244	MERRILL Norman B.....	827-1906		<b>COMMONWEALTH AV ENDS</b>	
1250	KNOWLES Delbert A.....	229-5579	1600	BALKUN John@.....	229-5626
1250	RUBINSTEIN Edna M.....	229-5579	1614	O'DAY Helen M@.....	229-6437
1252	No Information.....		1615	A A U P CONNECTICUT STATE UNIVERSITY AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS.....	224-8788
1254	USTILLA Anna M.....	223-8843	1615	A R A SERVICE.....	225-8401
1254	USTILLA John J.....	223-8843	1615	AMERICAN ASSOCIATION UNIVERSITY PROFESSORS STATE COLLEGE.....	224-8788
1256	No Information.....		1615	CENTRAL CONNECTICUT STATE UNIV.....	827-7288
1258	No Information.....		1615	CONNECTICUT STATE CONNECTICUT STATE UNIVERSITY AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS.....	224-8788
1260	No Information.....		1615	W F C S.....	223-6767
1262	MILLER Walter S.....	229-3264	1615	ALICANDRO Charles.....	225-7594
1264	No Information.....		1615	BASQUE Susan J.....	224-3557
1268	DAVIDSON Wilbur C.....	229-5920	1615	ERICKSON Laurel A.....	223-3864
	<b>KEARNEY AV BEGINS</b>		1615	PHILBRICK Gina M.....	224-8782
1270	No Information.....		1615	SANTORO L.....	224-4065
1272	BARD Emile D.....	223-2547	1620	MIKLOS Anna W@.....	229-6004
1272	BARD Gary.....	223-2547	1626	VALENTI SCHOOL OF PIANO & ORGAN.....	223-1982
1274	O'DRISCOLL Helen M.....	225-2930	1626	VALENTI Phineas G@.....	223-1982
1274	O'DRISCOLL Michael A.....	225-2930	1634	CATENZARO Diane M.....	225-6852
1276	LYON Nancy G.....	225-3898	1634	CATENZARO James M.....	225-6854
1302	PROFESSIONAL AMBULANCE SERVICE.....	224-7188	1634	CATENZARO John P@.....	225-6852
1302	PROFESSIONAL LIMOUSINE SERVICE.....	224-7188	1634	CATENZARO Marie C.....	225-6852
1302	ROBINSON HERMAN C.....	224-8792	1634	CATENZARO William F.....	225-6852
1302	ROBINSON Herman C@.....	224-8792		<b>HIGHLAND TERR BEGINS</b>	
1309	SIMMARY'S CEMETERY.....	225-1938	1646	ATASHIAN Vartkes H@.....	225-1919
1310	MAOLONE S M.....	224-6897	1650	DORBUCK Anthony A.....	229-9042
1316	SWANSON Danny L.....	224-3897	1650	DORBUCK Mary M@.....	229-9042
1320	BIENKOWSKI Carl J@.....	225-2042	1664	MORA Richard.....	229-1786
1320	BIENKOWSKI Mary.....	224-8414	1664	MORA Severine E@.....	229-1786
1320	PETIG William F@.....	224-8414		<b>WELLS ST BEGINS</b>	
1326	LINDGREN Leonard E@.....	223-6426		<b>EDDY GLOVER BLVD BEGINS</b>	
1326	SUTPHIN James K.....	224-9657		<b>NORTHERN PERIMETER RD BEGINS</b>	
1330	DUDACK Catherine@.....	229-2632	1707	COLLEGE SERVICE STATION.....	223-2032
1336	DesJARDINS Eugene.....	224-0666	1721	(ofc)SCHMITT FRANK J JR DR.....	229-8092
1340	No Information.....			<b>KILBOURNE AV BEGINS</b>	
	<b>ALLEN ST CROSSES</b>		1755	LABIENIEC ALPHONSE REV.....	225-6449
1347	ARROYO Elard@.....	223-7253	1755	SIFRANCIS OF ASSISI CHURCH.....	225-6449
1353	No Information.....		1755	SHINER Kenneth H Rev.....	827-1568
1355	Vacant.....		1757	SIFRANCIS OF ASSISI CONVENT.....	225-7143
1364	HACKETT E M.....		1757	SCHOOL SISTERS OF NOTRE DAME.....	225-7143
1365	ELECTRICAL CONTRACTORS.....	225-8109	1771	DIORIO Lisa A.....	224-3713
1365	CHURCH OF GOD.....	229-7787	1771	DIORIO Patricia B@.....	224-3713
1365	CHURCH OF GOD DAY CARE.....	229-9233	1777	LYNCH Patricia A@.....	229-5666
1365	KIDDIE KOLLEGE PRE-SCHOOL.....	229-9233	1785	RYBA Christopher B.....	224-9000
1365	BELL Juanita.....	229-7787	1785	RYBA Eugene S@.....	223-7307
1365	BELL Lawrence M Rev.....	229-7787	1791	GAFFNEY Robert P@.....	225-2230
1365	BELL Michele.....	229-7787	1795	RASCOE Harry J@.....	229-5917
1366	LICKWAR Jennie@.....	223-5684	1803	JACKSON Robert D.....	223-0761
1368	NIKOLA James G@.....	224-3827	1803	JACKSON William R Sr@.....	223-0761
	<b>HATCH ST BEGINS</b>		1813	ROBICHAUD Edmund J@.....	224-0261
1381	McCLUSKEY Richard John@.....		1813	ROBICHAUD James.....	224-0261
	<b>HILLCREST AV BEGINS</b>			<b>LYLE RD BEGINS</b>	
1394	LETENDRE Arthur W@.....	229-9973	1837	GIBEAU Paul E@.....	223-8231
1395	No Information.....		1843	No Information.....	
1402	HOGAN Mary Jane@.....	229-6474	1849	No Information.....	
1403	MALCYNISKY Gertrude S@.....	229-0672	1855	SMITH David C@.....	827-0460
	<b>ROXBURY RD BEGINS</b>		1863	COYLE Patrick.....	223-1726
1417	BETHEL ALLIANCE CHURCH.....	223-7634	1863	COYLE William B@.....	223-1726
1425	NORTON Glen E.....	225-5682	1863	COYLE William J.....	223-1726
1425	RUSSO Joseph J@.....	223-5940	1867	GIBEAU Michael.....	223-2014
1425	RUSSO Joseph J Jr.....	223-5940		<b>BLAKE RD ENDS</b>	
1426	GERMAIN Arthur E Jr.....	225-5453	1883	MOTTA Sebastian D 'Mike'@.....	225-0540
1431	STARCZEWSKI Jozef@.....	225-2714	1886	BROOKS Charles M.....	225-4721
1443	LANG Kenneth J@.....	229-2886	1891	(res)LYNCH Edward T Jr@.....	229-3938
1443	LANG Louise M@.....	229-2886	1894	FLOOD E A@.....	229-1888
1447	HART Sue@.....	229-9585			
1450	No Information.....				
	<b>SEFTON DR BEGINS</b>				
1456	DAVIS Kenneth C@.....	229-0131			
1462	O'SULLIVAN Charles R@.....	229-5316			
1475	CORRADINO P.....	223-8395			
1475	POGLITSCH John F@.....	229-3903			
1479	HAROUTUNIAN Harry@.....	224-0402			
1484	INMAN Helen B.....	229-4442			
1484	LEACH Eugene F@.....	229-4442			
1484	LEACH Eugene F Capt Retd.....	827-9431			
1487	PARSONS Charles R@.....	224-2954			
1493	McDERMOTT Jerone.....	224-1066			
1504	MORANT Joseph R Sr@.....	224-4211			
	<b>STRATFORD RD CROSSES</b>				
1516	No Information.....				

(Cont.)

**STRATFORD RD 1985****STRATFORD RD**

**FROM 78 SEFTON DR W TO 143  
CARLTON ZIP CODE 06053**

22 ZMITRUK Walter@.....225-8541  
32 BLOT A Doris@.....225-5654  
36 CAMARATA Louis A@.....223-8262  
42 LOPES Anthony@.....225-2408  
48 No Information

**STANLEY ST CROSSES****ELIZABETH ST ENDS**

124 No Information  
125 PRIOR Michael P.....223-6725  
125 PRIOR Paul J Sr@.....225-2871  
125 PRIOR Paul J Sr  
'children's phone'.....223-6725  
128 NYE James.....224-2342  
128 NYE Walter R.....224-2342  
130 BALDWIN Alex.....827-0831  
130 BALDWIN Burt Dr.....827-0831  
130 CARLSON Dean C.....827-9407  
131 LIZON James A.....229-7977  
131 LIZON Walter J@.....229-7977  
134 OTFINOWSKI Theresa M@.....229-2583  
137 SPRAGUE Margaret H@.....225-3837  
141 HUNT Robert@.....223-0549

**N WELLINGTON ST ENDS**

145 BOYKO Michael.....229-2674  
145 BOYKO William M Jr.....229-2674  
145 BOYKO William M Sr@.....229-2674  
147 LEAVITT Robert R@.....224-3889  
147 POLLOCK James.....224-3889  
147 POLLOCK Michael.....224-3889  
152 GARRITY M.....225-2598  
152 PREVITI Rose D@.....229-4474  
155 No Information  
158 No Information  
161 NEDOSKO Carolyn J.....225-4422  
161 NEDOSKO John S Jr@.....225-4422  
161 (2nd flr) NEDOSKO John S@.....229-5301  
164 REVZON Celia E@.....229-6006  
164 REVZON Michael A@.....229-6006  
169 LEWKO Kaziniera@.....223-7832  
169 LEWKO Paul S.....223-7832  
169 LEWKO Peter R.....223-7832  
169 LEWKO Walter.....223-7832  
170 CMUCKOWSKI Vincent G Jr.....223-1741  
170 CMUCKOWSKI Vincent G@.....223-1741

**STEWART ST ENDS**

175 No Information  
179 MacKENZIE Brian.....223-2922  
179 MacKENZIE David.....223-2922  
179 MacKENZIE Sophie@.....223-2922  
179 MacKENZIE Steve.....223-2922  
182 ZINK Richard J@.....223-0604  
187 TORELL Spencer P@.....229-1448  
188 SANTORA Rico@.....224-7727  
193 MENDITTO Thomas M@.....224-4445  
194 LARKIN John C@.....223-6757  
194 LARKIN Kathy M.....223-6757  
199 PETROKA David L.....223-6436  
199 PETROKA John F.....223-6436  
199 PETROKA John J@.....223-6436  
199 PETROKA Noelle A.....223-6436  
199 PETROKA Scott D.....223-6436  
200 No Information

**BRIGHTON ST ENDS**

205 SKWIOT Dawn Marie.....229-5821  
205 SKWIOT Matthew M.....229-5821  
205 SKWIOT Stanley S@.....229-5821  
213 TOMASSO Ellen I@.....229-5994  
213 TOMASSO Nora F@.....229-5994  
215 HEDENBERG David N@.....225-6378  
216 GARY Alexander@.....225-5945  
225 GALLUPE David.....225-1411  
225 GALLUPE Drew E.....225-1411  
225 GALLUPE Larry A@.....225-1411  
230 No Information  
231 BOUDREAU Irvin G@.....229-9107

**STREAMSIDE LN**

## STANLEY ST 1976

STANLEY ST - 1976		STANLEY ST - 1976	
1244	ZIEGLER ADAM H 223-5230	1536	RUBENSTEIN SAUL 229-7435
1246	GABCR ROSE MRS 225-4733	1537	NATURE SPIRIT 224-3590
1248	VACANT		NATURAL FOODS
1250	CURPIER STEVEN 225-2163		VACANT
1252	BURKE FRANCES MRS 225-6815		PANNACE GAETANO 224-0284
			ENGLISH SHAUN P 224-2932
1254	NEPOLITANO JAMES 229-0539		BELVIDERE PIZZA HOUSE 223-4124
1256	GAGNON ESTHER L MRS 229-0539		VACANT
1258	VACANT	1543	BELVIDERE BARBER SHOP 223-1700
1260	BERRIGAN DENNIS 229-3264		BELVIDERE STUDIO 229-2379
1262	MILLER WALTER S 229-3264		OF BEAUTY
1264	RUSSELL PHILIP G 223-6285	1543	A VACANT 2D FL FIDELITY UNION LIFE INSURANCE 225-8757
1266	OLIVER VERONICA 225-0069		CO-COLLEGE MASTER 225-8757
1268	DAVIDSON WILBUR 229-5920		2D FL FIDELITY UNION LIFE INSURANCE CO 225-8757
	- 1268 1/2 KEARNEY AV BEGINS		WELCH MARK ASSOCIATES 225-8757
1270	SEDCIESKI HENRY S 229-0511	1543	COLLEGE MASTER 225-8757
1272	BARD ENIDE 223-2547		MAHJUBIAN PAKRAD 229-4740
1274	O DRISCOLL ROBERT H 225-2930		- 1551 FRANCIS ST CROSSES
1276	LYON JULIA MRS 225-3898	1556	SCAPPELLATI PHILIP RUBITZ MICHAEL J 223-6103
1299	ST MARY S ROMAN CATHOLIC CEMETERY NEW ENTRANCE	1564	POLUBINSKI JOHN * 229-0003
		1568	MILLER M H REAL EST * 225-3693
1302	ENGINE CO NO 7 229-7760		DENTIST H
1309	ST MARYS CEMETERY 225-1938	1576	KRACZKOWSKY L H * 229-4500
1310	O BRIEN MARY J * 229-0292	1584	KOLCONEY ABRAHAM J * 229-5135
	O BRIEN JOHN J 224-0693	1590	KINNEY CHARLES B JR * 223-5135
1316	BODIA PEDRO VERENEAU RAYMOND 229-8287		- 1594 COMMONWEALTH AV ENDS
1320	PETIG WILLIAM YELENAD JOANNE 225-7075	1600	BALKIN JOHN * 229-5626
1326	BOURGEOIS MARY * 229-0460	1614	O DAY HELEN 229-6437
	LINDGREN LEONARD E * 223-6426	1615	CENTRAL CONN STATE COLLEGE 827-7000
1330	DUDACK JACOB T * 229-2632		W F C S FM RADIO STA 225-7481
1336	SAULNIER SUSAN * 229-2632	1620	MIKLOS ANN W MRS * 229-6004
1340	VACANT	1626	VALENTI P G TCHR * 223-1982
	- 1343 ALLEN ST CROSSES		MUSIC H
1347	VACANT	1634	CATENZARO JOHN P * 225-1791
1353	MEHLMORUER RUDOLPH J 229-6282		- 1642 HIGHLAND TER BEGINS
1355	REYNOLDS SALLY H MRS 229-4168	1646	ATASHIAN VARTKES H * 225-1919
1364	WENTWORTH WILLIAM D * 225-8819		VACANT
1365	CHURCH OF GOD * 229-7787	1650	DOPBUCK ANTHONY A * 229-9042
1366	LICKWAR JENNIE MRS * 223-5684	1654	HAMES ELIZABETH S MRS
1368	LITMAN ROBERT BELVIDERE HONOR ROLL WORLD WAR 2 VETERANS MEMORIAL CAMPBELL PARK ENTRANCE	1664	MORA SEVERINE E MRS * 229-1786
1369			- 1665 WELLS ST BEGINS
	- 1375 HATCH ST BEGINS		- 1670 EDDY GLOVER BLVD BEGINS
1381	MC CLUSKEY RICHARD J * 223-8510	1672	SULLIHAN MEMORIAL TABLET
	- 1389 HILLCREST AV BEGINS	1679	STANLEY SCHOOL 229-6560
1394	LETENDRE IDA L MRS * 229-9973	1693	SCHOTTA STEVEN 224-2838
1395	WILLIAMS IRENE S MRS 224-2113	1707	COLLEGE SERVICE 223-2032
	LANCASTER VINTON UPRANSKI LEROY 1403 MALCZYNSKY JOSEPH F * 229-0672		STATION GASOLINE 229-8092
	- 1416 ROXBURY RD BEGINS	1721	SCHMITT F J JR DENTIST
1417	BETHEL CHURCH 223-7634		- 1731 KILBOURNE AV BEGINS
1425	RUSSO JOSEPH J * 223-5940	1732	A W STANLEY PARK ENTRANCE
1431	STAPCZEWSKI JOSEPH * 225-2714	1738	VACANT
1443	LANG JOSEPH J * 229-2886	1745	ST FRANCIS OF ASSISI ROMAN CATHOLIC CHURCH 225-6449
1447	VACANT	1755	DULLARD HENRY REV 225-6449
1450	VACANT		ST FRANCIS OF ASSISI RECTORY 225-6449
	- 1451 SEFTON DR BEGINS	1757	ST FRANCIS OF ASSISI CONVENT 225-7143
1462	O SULLIVAN CHARLES R * 229-5316	1771	DIDRID JOSEPH A 225-4510
	COCOLA ANTHONY J 225-9721	1777	LYNCH PATRICIA A * 229-5666
1469	ANDERSON VICTOR H ANDERSON M G MRS 223-5732	1785	RYBA EUGENE S * 223-7307
	NURSE		MORLEY FREDERICK C * 229-1409
1475	MORA ROBERT 225-1700	1791	GAFFNEY ROBERT P * 225-2230
1479	POGLITSCH JOHN F 229-3903	1795	RASCOE HARRY J * 229-5917
	HAPOUTUNIAN HARRY * 224-0402	1803	JACKSON WILLIAM R * 223-0761
1484	PALMEPI JOSEPH MORA HELEN B MRS 229-6400	1813	ROBICHAUD EDMUND T * 224-0261
1487	LYNCH M A * 229-5938		- 1827 LYLE RD BEGINS
1493	VACANT	1837	CURRAN SIDNEY G * 229-4212
1495	VACANT	1843	CAMPANELLI LEONARD 223-7054
1504	VACANT	1849	DRAY GERTRUDE B MRS * 229-3432
	- 1507 STRATFORD RD CROSSES	1855	VACANT
1517	VACANT	1863	COYLE WILLIAM R * 223-1726
1523	BELVIDERE SERVICE STATION 223-5955	1867	REFUSED INFO
1524	SANZARO SOFIA MRS * 223-2485	1870	A W STANLEY PARK ENTRANCE
1527	BELVIDERE DRUG STORE 229-0311		- 1876 BLAKE RD ENDS
1528	BRUNETTE MICHAEL J * 225-2194		
1535	COLLEGE SPA RESTAURANT INC 223-2043		

## STRATFORD RD 1976

	Target Street	Cross Street	Source
	-----		
	STRATFORD RD FR 78 SEFTCN DR W TO		
7	143 CARLTON /RIGHT ODD/ ZIP		
	CODE 06053		
2	3	HAVLICK ALBERT J *	229-6691
9	9	ERICSON ALMA S MRS	
8			* 229-3396
7	22	ZMITRUCH WALTER	225-8541
	32	BLOT DORIS A	* 223-8038
4	35	PRISCO DANNY	224-8096
3	36	CAMARATA LOUIS A *	223-8262
4	39	SPRING FRANCIS J *	229-3312
	41	VACANT	
	42	LOPES ANTHONY	* 225-2408
4	48	GREENBERG MARTIN *	229-6412
	-	91 STANLEY ST CROSSES	
	-	120 ELIZABETH ST ENDS	
	124	SYLVESTER GEORGE JR	
			225-8395
9	125	PRIOR PAUL J	* 225-2871
	126	VACANT	
8	128	FAUCHER KATHLEEN	
		PFUNTNER MARK	224-3809
	130	RYE WALTER	224-2342
	131	LIZON WALTER	229-7977
6	134	OTFINOWSKI LOUIS A	
7			* 229-2583
2	137	SPPAGUE WESLEY R *	225-3837
0	141	HUNT ROBERT	* 223-0549
	-	142 N WELLINGTON ST ENDS	
5	145	BOYKO WILLIAM M *	229-2674
9	147	STUART HARRIET E MRS	
5			* 229-6389

## STRATFORD RD 1976

93

152	PREVITI ANTHONY *	229-4474
	VACANT	
	PAGNIOS GEORGE *	
	KARIDAS STILIANCS	
155	AUGSBURGER KARL *	225-3138
158	MC KNERNEY ROY J *	223-4898
161	NEDOSKO JOHN S *	229-5301
164	REVZON CELIA E MRS	
		* 229-6006
169	LEWKO JOHN	223-7832
170	MADIGAN GERARD J *	225-3975
	MADIGAN B A MRS NURSE	
		225-3975
- 172 STEWART ST ENDS		
175	BANNON THOMAS P *	
179	MAC KENZIE DONALD	
		223-2932
182	LOOMIS B C MRS *	229-6104
187	TORELL SPENCER P *	229-1448
188	DILLON ANNA C MRS	
		229-6488
193	BADRIGIAN HARRY *	229-0485
194	LARKIN JOHN	223-6757
199	PETROKA JOHN J	223-6436
200	LINDIA ALBERT	223-2654
- 202 BRIGHTON ST ENDS		
205	SKWIDT STANLEY S *	229-5821
213	TOMASSO JULIA S MRS	
		* 229-5994
215	HEDENBERG DAVID M	
		229-5639
216	GARY ALEXANDER *	225-5945
219	ANDERSON ALPHILD V	
		* 229-6624
225	GROMKO JOHN F *	229-5490
230	SCAPELLATI ALBERT L	
		* 225-4195
231	BOUDREAU IRVIN G	229-9107

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 SULLIMAN DR FR 159 AMHERST E TO  
 52 BEECHER RD / BRIGHT 000 / 310





## STANLEY ST 1972

92	1973 - THE PRICE
STANLEY (CONT)	1544 NO LISTING
1309 ST MARYS CEMETERY	- 1551 FRANCIS ST CROSSES
1310 O BRIEN M J * 225-1938 O BRIEN JOHN J * 229-0292 224-0693	1556 SCAPELLATI PHILIP * 223-5319
1316 MOREHEAD CHARLES L JR * 229-9911	RUBITZ MICHAEL J * 223-6103
VACANT	1564 POLLBINSKI JOHN * 229-0003
1320 BIENKOWSKI M A MRS * 225-5291	1568 MILLER M H REAL EST * 225-3693
VACANT	1576 KRACZKOWSKY L H * 225-4500
1326 BOURGDIS MARY * 223-3066	1584 KOLCDNEY A J * 223-5135
LINDGREN L E * 223-6426	1590 KINNEY CHARLES B JR * 223-5135
1330 MC ALDON F V * 229-2632	- 1594 COMMONWEALTH AV ENDS
1336 POPLIN ROBERT *	1600 BALKIN JOHN * 229-5626
1340 VACANT	1614 O DAY HELEN * 229-6437
KNOWLTON JOHN * 224-0637	1615 CENTRAL CONN STATE COLLEGE W F C S FM RADIO STA * 225-7481
- 1343 ALLEN ST CROSSES	HENRY BARNARD HALL * 223-9547
1347 ZAWILINSKI J S * 229-5314	1615 ELIHU BURRITT LIBRARY * 225-6351
PRICE MARGARET M * 229-1071	1615R CATHERINE BEECHER HALL * 223-9725
1353 MEHLMORUER RUDDOLPH J * 229-6282	1615 MARIA SANFORD HALL * 223-9623
1355 REYNOLDS SALLY H MRS * 229-4168	SHERIDAN HALL * 225-6351
1364 WAIDA LAWRENCE * 223-8169	GALLANDET HALL * 223-9900
1366 LICKWAR JENNIE MRS * 223-5684	SETH NORTH HALL * 223-9574
1368 PAWLICK JOHN *	DORMITORY * 223-9710
1369 BELVIDER HONOR * 223-5684	CLARENCE CARROLL HALL DORMITORY * 223-9710
ROLL WORLD WAR 2 VETERANS MEMORIAL	MARCUS WHITE HALL DORMITORY * 223-9350
CAMPBELL PARK ENTRANCE	1620 MIKLOS ANN W MRS * 229-6004
- 1375 HATCH ST BEGINS	1626 VALENTI P G TCHR * 223-1982
1381 MC CLUSKEY RICHARD J * 223-8510	1634 CATENZARO JOHN P * 225-1791
- 1389 HILLGREST AV BEGINS	- 1642 HIGHLAND TER BEGINS
1394 LETENDRE IDA L MRS * 229-9973	1646 ATASHIAN VERTKES H * 225-1919
1395 WILLIAMS IRENE S MRS * 224-2113	VACANT * 229-9042
LANCASTER VINTON P * 223-5011	1650 DORRBUCK A A * 225-5327
1402 ADAMS STANLEY * 223-5361	1654 HAMES ELIZABETH S MRS * 229-1786
1403 MALCYNKY JOSEPH F * 229-0672	1664 MORA SEVERINE E MRS * 229-1786
- 1416 ROXBURY RD BEGINS	- 1665 WELLS ST BEGINS
1417 BETHEL CHURCH * 223-7634	- 1670 EDDY GLOVER BLVD BEGINS
1425 RUSSO JOSEPH J * 223-5940	1672 SULLIMAN MEMORIAL TABLET * 229-6560
1431 STARCZEWSKI JOSEPH * 225-2714	1679 STANLEY SCHOOL * 225-8092
1443 LANG JOSEPH J * 229-2886	1693 IHNATOWICZ ZOFIA H MRS * 224-2838
1447 RILEY MILDRED H MRS * 223-2133	MCKENNA WILLIAM J * 223-2023
1450 VACANT	1707 COLLEGE SERVICE STATION GASOLINE * 225-8092
- 1451 SEFTON DR BEGINS	DENTIST
1462 O SULLIVAN CHARLES R * 229-5316	- 1731 KILBOURNE AV BEGINS
VACANT	1732 A W STANLEY PARK ENTRANCE
1469 ANDERSON VICTOR H * 223-5732	1738 VACANT
ANDERSON M G MRS * 223-5732	1745 ST FRANCIS OF ASSISI ROMAN CATHOLIC CHURCH * 225-6449
NURSE	1755 DULLARD HENRY REV * 225-6449
1475 MORA ROBERT * 225-1700	ST FRANCIS OF ASSISI RECTORY * 225-6449
1479 POGELTSCH JOHN F * 224-0402	1757 ST FRANCIS OF ASSISI CONVENT * 229-7143
HARCUTUNIAN HARRY * 229-3903	1771 DIORIO JOSEPH A * 229-5666
1484 VACANT	1777 LYNCH PATRICIA A * 223-7307
MORA HELEN B MRS * 225-6400	1785 RYBA EUGENE S * 229-1409
1487 LYNCH ALICE * 229-5938	1791 GAFFNEY ROBERT P * 225-2230
1493 VACANT	1795 RASCOE HARRY J * 229-5917
1504 MORANT J R * 224-4466	1803 JACKSON W R * 223-0761
- 1507 STRATFORD RD CROSSES	1813 ROBICHAUD E J * 224-0261
1517 AUGIE & RAY S * 224-7001	- 1827 LYLE RD BEGINS
DRIVE-IN REST	1837 CURRAN SIDNEY G * 229-4212
1523 BELVIDERE * 223-5955	1843 CAMPANELLI LEONARD * 223-7054
SERVICE STATION	1849 DRAY GERTRUDE B MRS * 229-3432
1524 SANZARO SOFIA MRS * 223-2485	1855 ROSENTHAL EMANUEL * 223-4909
BELVIDERE DRUG STORE * 229-0311	1863 COYLE WILLIAM B * 223-1726
1528 BRUNETTE MICHAEL J * 225-2194	1867 GIBEAU MICHAEL P * 223-2014
1535 COLLEGE SPA * 223-2043	1870 A W STANLEY PARK ENTRANCE
RESTAURANT INC	- 1876 BLAKE RD ENDS
1536 RUBENSTEIN SAUL * 229-7435	1883 FRENCH RICHARD * 225-3162
1537 VACANT	FRENCH R P REAL ESTATE * 225-3162
CLAY WILLIAM T * 225-9377	
PANNACE GAETANO * 224-0284	
1539 ENGLISH SHAUN * 229-2932	
BELVIDERE PIZZA HOUSE * 223-4124	
VACANT	
1543 BELVIDERE BARBER SHOP * 223-1700	
BELVIDERE STUDIO * 229-2379	
OF BEAUTY	
1543 A VACANT	
2D FL FIDELITY UNION LIFE * 225-8757	
INSURANCE CO-COLLEGE MASTER * 225-8757	
FRIENDLY UNION LIFE INSURANCE CO * 225-8757	
COLLEGE MASTER * 225-8757	

STRATFORD RD 1972

95 ZITO LUKE 225-9756  
 97 VACANT  
 99 VACANT  
 101 VACANT  
 103 VACANT  
 105 BENNETT MAJORIE 223-3581

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 STRATFORD RD FR 78 SEFTON DR W TO  
 143 CARLTON /RIGHT OOD/ ZIP  
 CODE 06053

3 HAVLICK A J \* 229-6691  
 9 ERICSON ALMA S MRS \* 229-3396  
 22 ZMITRUCH WALTER 225-8541  
 32 BLOT DORIS A \* 223-8038  
 35 KMETZ JOSEPH T \* 224-8096  
 36 LOPES C MRS \* 223-8262  
 39 SPRING FRANCIS J \* 229-3312  
 41 SPRING ANTON J \* 229-3175

## STRATFORD RD 1972

		1973 - THE PRIC	
	42	LOPES ANTHONY	* 225-2408
	48	GREENBERG MARTIN	* 229-6412
14	-	91 STANLEY ST	CROSSES
13	-	120 ELIZABETH ST	ENDS
14			
	124	SALA ADOLPH	229-9093
	125	PRIOR PAUL J	* 225-2871
	126	GREGERICK PAUL M	225-8514
	128	FAUCHER KATHLEEN	
		VACANT	
	130	TRICHKA ROBERT E	* 225-8212
19		VACANT	
13	134	OTFINOWSKI L A	* 229-2583
18	137	SPRAGUE WESLEY R	* 225-3837
	141	HUNT ROBERT	* 223-0549
	-	142 N WELLINGTON ST	ENDS
16			
	145	BUYKO WILLIAM M	* 229-2674
12	147	STUART HARRIET E	MRS
10			* 229-6389
13	152	PREVITI ANTHONY	* 229-4474
15		PAGNIOS GEORGE	* 229-6567
19		KARIDAS STILIANOS	
19			
13	155	AUGSBURGER KARL	* 225-3138
	158	MC KNERNEY ROY J	* 223-4898
4	161	NEDCSKO JOHN S	* 229-5301
19	164	REVZON CELIA E	MRS
			* 229-6006
18	169	CORAZZO IRENE M	MRS
			* 229-2295
	170	MADIGAN GERARD J	* 225-3975
		MADIGAN B A	MRS NURSE
5			225-3975
1	-	172 STEWART ST	ENDS
7			
	175	BANNON THOMAS P	*
	179	HUMPHREYS M G	*
4	182	LOOMIS B C	MRS * 229-6104
	187	TORELL SPENCER P	* 229-1448
6	188	DILLON ANNA C	MRS
7			229-6488
0	193	BADRIGIAN HARRY	* 229-0485
	194	LARKIN JOHN	223-6757
0	199	VACANT	
5	200	LINDIA ALBERT	223-2654
5			
6	-	202 BRIGHTON ST	ENDS
2			
8	205	SKWIOT STANLEY S	* 229-5821
8	213	TOMASSO JULIA S	MRS
6			* 229-5994
8	215	HEDENBERG DAVID M	
	216	GARY ALEXANDER	* 225-6566
	219	ANDERSON ALPHILD V	
			* 229-6624
	225	GROMKO JOHN F	* 225-5490
	230	SCAPELLATI ALBERT L	
			* 225-4195
9	231	BOUDREAU IRVING J	
			229-9107
7	- - - - -		
6		SULLIMAN DR FR 159 AMHERST E TO	
		52 BEECHER RD / RIGHT HAND / ZIP	

## STANLEY ST 1968

R LEE CO.	
1417	BETHEL CHURCH 223-7694
1425	RUSSO JOSEPH J □ 223-5940
1431	THEOPHIL ALICE E MRS □ 225-9335
1443	LANG JOSEPH J □ 229-2866
1447	RILEY MILDRED O MRS □ 223-2133
1450	HORNKOHL R A □ 223-6952
1451 SEFTON DR BEGINS	
1462	O SULLIVAN CHARLES R □ 229-5316
1469	ANDERSON VICTOR H 223-5732
	ANDERSON M G MRS NURSE 223-5732
1475	MORA ROBERT 225-1700
	POGLITSCH JOHN F 229-3903
1479	HAROUTUNIAN HARRY □ 224-0402
1484	INMAN HELEN B MRS 229-4442
	MORA H RICHARD 229-6400
1487	LYNCH ALICE □ 229-5938
1493	SACHS J A MD □ 223-0202
1497	MC GRAIL JOHN H □ 229-7796
1504	MORANT J R OLIVE OIL □ 229-2206
	FORSBERG KENDALL F 225-8511
1507 STRATFORD RD CROSSES	
1517	BELVIDERE FOOD CENTER GROCERS 229-5026
1523	BELVIDERE SERVICE STATION 223-5955
1524	SANZARO SOFIA MRS □ 223-2485
1527	BELVIDERE DRUG STORE 229-0311
	POST OFFICE SUB STATION NO 11
1528	BURNETTE M J □ 225-2194
1531	VACANT
1535	COLLEGE SPA RESTAURANT INC 223-2043
1536	MUSSMAN LOUIS □ 229-7435
1537	BELVIDERE 9-10 TO 100 STORE 225-0621
	ARENAS MARCO 225-5078
	WIGNOT RICHARD G 229-7316
1539	MOODY S R 224-2546
	BELVIDERE PIZZA HOUSE 223-4124
1543	DATISTIONE PETER BELVIDERE BARBER SHOP 223-1700
	BELVIDERE STUDIO OF BEAUTY 229-2379
	VACANT
1543A	GALLOPING ELEPHANT THE REST 223-9698
1543R	VACANT
	2D FL FRIENDLY UNION LIFE INSURANCE CO 225-8757
1544	PUDLIN ALVIN □ 229-7612
1551 FRANCIS ST CROSSES	
1556	SCAPELLATI PHILIP □ 229-6136
	VACANT
1564	POLUBINSKI JOHN □ 225-4427
1568	MILLER M H REAL EST □ 229-0003
1576	KRACZKOWSKY L H DENTIST □ 225-3693
1584	KOLODNEY A J □ 229-4500
1590	KINNEY CHARLES B □ 223-5135
1594 COMMONWEALTH AV ENDS	
1600	BALKUN JOHN JR □ 229-5626
1614	O DAY HELEN M □ 229-6437
1615	CENTRAL CONNECTICUT STATE COLLEGE 225-6351
	CLARENCE CARROLL HALL DORMITORY 223-9574
	CLARENCE CARROLL HALL WING DORMITORY 223-9314
	HENRY BARNARD HALL 223-9547
	CATHERINE BEECHER HALL 223-9725
	ELIHU BURRITT LIBRARY 225-6351
	MARIA SANFORD HALL 223-9625
	SHERIDAN HALL SAMUEL MAY HALL 225-6331
1615R	SETH NORTH HALL DORMITORY 223-9900
	MEMORIAL HALL GYMNASIUM 223-9398
	MARCUS WHITE HALL DORMITORY 223-9710
	BOOK STORE 223-6478
	EAST HALL 223-9350
	RUPERT M ISABELLE 229-1013
1620	MIKLOS J C □ 229-6004
1626	VALENTI P G TCHR MUSIC □ 223-1982
1634	CATENZARO JOHN P □ 225-1791
1642 HIGHLAND TER BEGINS	
1646	ATASHIAN VERTKES H □ 225-1919
1650	DORBUCK A A □ 229-9042
1654	HAMES ELIZABETH S MRS 225-5327
1664	MORA SEVERINE E MRS □ 229-1706
1665 WELLS ST BEGINS	
1670 EDDY GLOVER BLVD BEGINS	
1672	SULLIMAN MEMORIAL TABLET
1679	STANLEY SCHOOL 229-6560
1693	INHATOWICZ WLADYSLAW 229-5657
1707	MALS SERVICE STATION 223-9991
1721	SCHMITT F J JR DENTIST 225-8092
1731 KILBOURNE AV BEGINS	
1732	A W STANLEY PARK ENTRANCE
1738	NO LISTING
1745	ST FRANCIS OF ASSISI ROMAN CATHOLIC CHURCH 225-6449
1755	DULLARD HENRY REV 225-6449
	ST FRANCIS OF ASSISI RECTORY 225-6449
1757	ST FRANCIS OF ASSISI CONVENT 225-7143
1771	MC GRAIL MARGUERITE C □ 225-3468
1777	LYNCH PATRICIA A □ 229-5666
1785	RYBA EUGENE S □ 223-7307
	MORLEY FREDERICK C □ 229-1409
1791	GAFFNEY ROBERT P □ 225-2230
1795	RASCOE HARRY J □ 229-5917
1803	JACKSON W R □ 223-0761
1813	ROBICHAUD E J □ 224-0261
1827 LYLE RD BEGINS	
1837	CURRAN SIDNEY G □ 229-4212
1843	CAMPANELLI LEONARD 223-7054
1849	DRAY E J □ 229-3432
1855	ROSENTHAL EMANUEL □ 223-4909
1863	BLAIR CATHEA E MRS □ 229-1543
1867	GIBEAU MICHAEL P □ 223-2014
1870	A W STANLEY PARK ENTRANCE
1876 BLAKE RD ENDS	
1883	MOTYKA S J □ 223-6558
1886	FLOOD M A □ 229-9091
1891	LEWIS DAVID □ 223-1916
1894	FLOOD PETER C □ 229-1888
1897	KELLY DIXS JOHN □ 225-8234
1901	NOVECK NATHAN □ 229-0051
1904	PETERSON CLARENCE H □ 225-3623
1913	CARLSON ANNA C MRS □ 229-0802
1919	PELLETIER H D □ 229-5886
1927	ZISK JOHN V □ 229-5979
1928	BLAKE H S □ 229-0166
1935 BARBOUR RD BEGINS	
1939	STEARNS HOWARD Y □ 229-0713
1950	EVANGELICAL LUTHERAN CHURCH OF THE REFORMATION 223-4896
1963 FAIRWAY DR /1ST PART/ BEGINS	
1970	CARBONELL JOAQUIN M □ 229-8356
1980	KASK JOSEPH J □ 225-2966
1983	CLARK BLISS W □ 229-3506
1988	STOUTENBERG J H □ 229-7488
1996	VANBREMAN LEE L □ 223-0247
1997 ROSEMARY LA BEGINS	
2008	IBELLE ROSLYN A □ 229-2960
2017 DRURY LA BEGINS	
2018	HOTCHKISS R E □ 229-6444
2021	ZIZZAMIA J P □ 229-7095
2024	HOWARD RICHARD B □ 225-2144
2030	BERNACKI WALTER H 229-7445

## STRATFORD RD 1968

STRATFORD RD FR 78 SEFTON DR W TO  
143 CARLTON /RIGHT ODD/ ZIP  
CODE 06053

3 HAVLICK A J ☐ 229-6691  
9 ERICSON ALMA S MRS  
☐ 229-3396  
15 ROGERS R E BUILDER  
223-0992  
19 HAVEL JOSEPH F ☐ 223-7492  
22 HUNTINGTON JOHN T  
☐ 229-6257  
25 POULIN LEOPOLD J ☐ 229-2666  
32 BLOT DORIS A ☐ 223-8039  
35 GITTLEMAN HAROLD ☐ 224-2138  
36 LOPES C MRS ☐ 223-8362  
39 SPRING FRANCIS J ☐ 229-3312  
41 SPRING ANTON J JR  
☐ 229-3175  
42 LOPES ANTHONY ☐ 225-2408  
48 GREENBERG MARTIN ☐ 229-6412

91 STANLEY ST CROSSES  
120 ELIZABETH ST ENDS

124 D ALFONSO JOSEPH 225-9283  
125 PRIOR PAUL J ☐ 225-2871  
126 LA ROSE HUBERT N 223-4770  
128 SCHNEIDER MARK G 225-3690  
130 WATERS NELSON D ☐  
VACANT  
131 TRICHKA ROBERT E 225-8212  
134 OTFINOWSKI L A ☐ 229-2583  
137 SPRAGUE WESLEY R ☐ 225-3837  
141 HUNT ROBERT ☐ 223-0549

142 N WELLINGTON ST ENDS

145 BOYKO WILLIAM M ☐ 229-2674  
147 STUART CHARLES F ☐ 229-6389  
152 PREVITI ANTHONY ☐ 229-4474  
GENTILE EDWARD F 223-0659  
155 AUGSBURGER KARL ☐ 225-3138  
158 MC KNERNEY ROY J ☐ 223-4898  
161 NEDOSKO JOHN S ☐ 229-5301  
164 REVZON H H ☐ 229-6006  
169 CORAZZO IRENE M MRS  
☐ 229-2295  
170 MADIGAN GERARD J ☐ 225-3975

172 STEWART ST ENDS

175 SLOAN GRACE M ☐ 229-0691  
179 HUMPHREYS M G ☐ 229-2710  
182 LOOMIS B C MRS ☐ 229-6104  
187 TORELL SPENCER P ☐ 229-1448  
188 DILLON WILLIAM F ☐ 229-6488  
193 BADRIGIAN HARRY ☐ 229-0485  
194 HOFFMAN ILLA F ☐ 229-1240  
199 HAYES MARY L MRS ☐ 229-1026  
200 PAULSON GERTRUDE MRS  
☐ 229-2135

202 BRIGHTDN ST ENDS

205 WERMUTH PAUL C ☐ 223-7602  
213 TOMASSO JULIA S MRS  
☐ 229-5994  
215 MUIRHEAD DONNA H MRS  
☐ 229-3623  
216 GARY ALEXANDER ☐ 225-6566  
219 ANDERSON ALPHILD V  
☐ 229-6624  
225 GROMKO JOHN F ☐ 229-5490

## STRATFORD RD 1968

## 1968—PRICE &amp;

52	230	SCAPELLATI ALBERT L	
90			□ 225-4195
	231	VACANT	
54	-----		
15	SULLIMAN DR FR 159 AMHERST E TO		
09	52 RECANO RD /RIGHT ODD/ ZIP		
59	CODE 06053		
73	24	BAUER RUSSELL M	□ 223-4817
24	25	RECANO RD ENDS	
39	-----		
98	SUMMIT RD FR 39 LONG SWAMP RD N		
	AND W AND S IN HALF CIRCLE TO		
	155 DO /RIGHT ODD/ ZIP CODE		
05	06053		
68	5	WILLIS JULIUS D	223-5831
41	7	LAWSON BOBBY	225-3219
	9	GREENLAW WESLEY G	
47			224-1925
94	10	VACANT	
76	11	BERUBE RAYMOND R	229-5682
07	12	BOSTON JAMES E	225-3939
50	13	STEWART WILLIAM W	
69			223-0349
25	14	VOISINE GILMAN N	223-3940
36	15	MORRIS JAMES P	223-6458
22	16	FRIEND FRANK	225-3053
28	18	LEONARD JAMES H	224-0007
48	19	CHRISLIUS JOHN	223-5284
86	21	O BRIEN JAMES F	223-3909
28	23	ROBINSON ELMER	
	25	WOODBURY DORIS R MRS	
			225-8096
	27	SHAW ANGIE MRS	229-4707
0	29	CROCKETT CHARLES H	
			223-1755

## STANLEY ST 1964

© Lindgren L E	BA3-6426
Spring A J & Sons milk	
	BA3-3066
1330© McAloon F V	BA9-2632
1336© Johnson E B Mrs	BA9-1894
1340© Piascik Donald J	BA4-1161
PiascikJames L	BA9-5146
<b>1343 ALLEN ST crosses</b>	
1347© Zawilinski J S	BA9-5314
Price William J	BA9-1071
1353 Mehlmorier Rudolph	BA9-6282
1355 Brazatis Margaret E Mrs	
	BA3-4894
1364© Cosgrove Catherine C Mrs	
	BA9-2274
1366© Lickwar Jennie Mrs	BA3-5684
Lickwar E M nurse	BA3-5684
1368© Wilson Edward	BA9-2316
<b>1375 HATCH ST begins</b>	
1381© McCluskey Richard J	BA3-8510
<b>1389 HILLCREST AV begins</b>	
1394© Letendre Ida L Mrs	BA9-9973
1395 Vacant	
1402© Zehler Louise P	BA3-1526
1403© Malcynsky J J	BA9-0672
<b>1416 ROXBURY RD begins</b>	
1417 Bethel Church	BA4-7634
1425© Russo Joseph J	BA3-5940
1431© Spetla Jarvslav	BA3-2846
1443© Lang Joseph J	BA9-2886
1447© Riley Basil A	BA3-2133
1450© Hornkohl R A	BA3-6952
Hornkohl P R Mrs nurse	
	BA3-6952
<b>1451 SEFTON DR begins</b>	
1462© O'Sullivan Charles R	BA9-5316
1469 Hession William J	BA3-9692
1475 Terry Arthur E	BA3-8928
Poglitich John F	BA9-3903
1479© Haroutunian Harry	BA4-0402
1484 Inman R B civil eng	BA9-4442
Mora H Richard	BA9-6400
1487© Lynch Alice	BA9-5938
1493© Sachs J A MD	BA3-0202
1497© McGrail John H	BA9-7796
1504© Morant J R olive oil	BA9-2206
<b>1507 STRATFORD RD crosses</b>	
1517 Belvidere Food Center grocers	
	BA9-6350
1523 Belvidere Service Station	
	BA3-5955
1524© Sanzaro Sofia Mrs	BA3-2485
1527 Belvidere Drug Store	BA9-0311
Post Office Sub Station No 11	
1528© Brunette M J	BA5-2194
1531 Coin A Matic laundry	
1535 College Spa Restaurant Inc	
	BA3-9434
1536© Mussman Louis	BA9-7435
1537 Belvidere 5¢-10¢ to \$1.00	
Store	BA5-0621
Vacant	
Tresky Jessie Mrs	BA3-1793
1539 Belvidere Pizza House	
	BA3-4124
Pagonis John N	BA3-3574
1543 Belvidere Barber Shop	
	BA3-9341
1543a Vacant	
1544© Pudlin Alvin	BA9-7612
<b>1551 FRANCIS ST crosses</b>	
1556© Scapellati Philip	BA9-6138
Moore Merrill H Jr	BA3-9149
1557 Anderson Victor H	BA3-5732
Anderson M G Mrs nurse	
	BA3-5732
1563 Patio The rest	BA3-9037
1564 Polubinski John	BA5-6061
1568© Miller M H	BA9-0003
1576© Kraczkowsky L H dentist	
	BA5-3693
1584© Kolodney A J	BA9-4500
1590© Kinney Charles B	BA3-5135
<b>1594 COMMONWEALTH AV ends</b>	
1600© Balkun John Jr	BA9-5626
1614© Moran Alice J	BA9-6437
1615 Central Connecticut State	
College	BA5-6351
Clarence Carroll Hall dormi-	
tory	BA3-9574

## STRATFORD RD 1964

### STRATFORD RD

Fr 78 Sefton dr W to 143 Carlton  
(Right odd)

30 Havlick A J	BA9-6691
90 Ericson Alma S Mrs	BA9-3396
150 McMahan Anna B	BA9-2573
190 Havelebitch Joseph F	
	BA3-7492
220 Huntington John T	BA9-6257
250 Poulin Leopold J	BA9-2666
320 Blot Anna M Mrs	BA3-8038
350 Gittleman Harold	BA4-1126
360 Lopes C Mrs	BA3-8262
390 Spring Francis J	BA9-3312
410 Spring Anton J Jr	BA9-3175
420 Lopes Anthony	BA5-2408
480 Greenberg Martin	BA9-6412

91 STANLEY ST crosses

120 ELIZABETH ST ends

124 Kavanaugh W J Jr	BA4-1479
1250 Prior Paul J	BA5-2871
126 LaRose Hubert N	BA3-4770
1280 Chichester Lyle F	BA5-7095
130 Coussoule John P	
	BA9-7712
1310 Robison C F Jr	BA9-3126
1340 Otfinowski L A	BA9-2583
1370 Sprague Wesley R	BA5-3837
1410 Hunt Robert	BA3-0549

142 N WELLINGTON ST ends

1450 Boyko William M	BA9-2674
1470 Stuart Charles F	BA9-6389
1520 Previti Anthony	BA9-4474
	BA3-0659
1550 Conlon Delia A Mrs	BA9-3555
1580 McKnerney Roy J	BA3-4898
1610 Nedosko John	BA9-5301
1640 Revzon H H	BA9-6006
1690 Corazzo Armond J	BA9-2295
1700 Madigan Gerard J	BA5-3975

172 STEWART ST ends

1750 Sloan Grace M	BA9-0691
1790 Humphreys M G	BA9-2710
1820 Loomis B C Mrs	BA9-6104
1870 Torell Spencer P	BA9-1448
1880 Dillon William F	BA9-6488
	BA9-6488

1930 Badrigian Harry	BA9-0485
1940 Hoffman Illa F	BA9-1240
1990 Hayes Matthew J	BA9-1026
2000 Paulson Gertrude Mrs	
	BA9-2135

202 BRIGHTON ST ends

2050 Wermuth Paul C	BA3-7602
2130 Tomasso Julia S Mrs	BA9-5884
215 Muirhead Donna H Mrs	
	BA9-3623
2160 Gary Alexander	BA5-6566
2190 Anderson John A	BA9-5490
2250 Gromko John F	BA9-5490
2300 Krieger Louis Jr	BA9-1502
2310 Garofalo Rosario S	BA5-7392

### SULLIMAN DR

Fr 159 Amherst E to 52 Recano rd  
(Right odd)



**Proposed Parking Garage**

55 Paul Manafort Drive  
New Britain, CT 06053

Inquiry Number: 5030788.1  
August 25, 2017

# The EDR-City Directory Image Report

## TABLE OF CONTENTS

### SECTION

Executive Summary

Findings

City Directory Images

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

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## EXECUTIVE SUMMARY

### DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

### RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

<u>Year</u>	<u>Target Street</u>	<u>Cross Street</u>	<u>Source</u>
2013	L	L	Cole Information Services
2008	L	L	Cole Information Services
2003	L	L	Cole Information Services
1999	L	L	Cole Information Services
1995	œ	œ	Cole Information Services
1992	œ	L	Cole Information Services
1985	œ	L	Johnson's City Directory
1976	œ	L	Price & Lee's City Directory
1972	œ	L	Price & Lee's City Directory
1968	œ	L	Price & Lee's City Directory
1964	œ	L	Price & Lee's City Directory

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## FINDINGS

### TARGET PROPERTY STREET

55 Paul Manafort Drive  
New Britain, CT 06053

Year

CD Image

Source

### PAUL MANAFORT DR

2013	pg A2	Cole Information Services	
2008	pg A4	Cole Information Services	
2003	pg A6	Cole Information Services	
1999	pg A8	Cole Information Services	
1995	-	Cole Information Services	Street not listed in Source
1992	-	Cole Information Services	Street not listed in Source
1985	-	Johnson's City Directory	Street not listed in Source
1976	-	Price & Lee's City Directory	Street not listed in Source
1972	-	Price & Lee's City Directory	Street not listed in Source
1968	-	Price & Lee's City Directory	Street not listed in Source
1964	-	Price & Lee's City Directory	Street not listed in Source

# FINDINGS

## CROSS STREETS

<u>Year</u>	<u>CD Image</u>	<u>Source</u>
<b><u>FRANCIS ST</u></b>		
2013	pg. A1	Cole Information Services
2008	pg. A3	Cole Information Services
2003	pg. A5	Cole Information Services
1999	pg. A7	Cole Information Services
1992	pg. A9	Cole Information Services
1985	pg. A10	Johnson's City Directory
1985	pg. A11	Johnson's City Directory
1976	pg. A12	Price & Lee's City Directory
1976	pg. A13	Price & Lee's City Directory
1972	pg. A14	Price & Lee's City Directory
1972	pg. A15	Price & Lee's City Directory
1972	pg. A16	Price & Lee's City Directory
1968	pg. A17	Price & Lee's City Directory
1964	pg. A18	Price & Lee's City Directory

## **City Directory Images**

**FRANCIS ST 2013**

114	BARBARA WOZNIAK
115	KEVIN BROWN
118	MARY JOYCE
121	THOMAS REALE
122	OCCUPANT UNKNOWN
125	THOMAS KELLY
128	STEVE YEZIK
129	BARBARA URBANSKI
130	OCCUPANT UNKNOWN
131	BRETT MICHALEK
134	ELEANOR GODWAY
135	ROY RIGGINS
138	GEORGE KOWALCYK
141	GLORIA EMEAGWALI
142	FRANK GRZYB
145	ADRIAN CREPLINSKI
146	CROSBY W J PLUMBING & HEATING WILLIAM CROSBY
150	KAREN KANAPLE
156	BARBARA HART

**PAUL MANAFORT DR 2013**

55	STATE OF CONNECTICUT
89	ANTHONY FLORIAN
101	SHERREE SUTTON
109	JAMES COWANIEC
115	CHRISTOPHER RACKLIFFE IAN CRANSTON
145	OCCUPANT UNKNOWN
274	CHELSEA WOODS DEPAUL AVANT ELIZABETH KOMMRIEZ ERIC CHORNEY GRICELIA FELICIANO JASON DILLESBOW KEVIN BOOKER NATHANIEL SLATER WAYNE TWOMBLY
305	MICHAEL VINCI
315	OCCUPANT UNKNOWN
321	SUZANNE GANEM
329	OCCUPANT UNKNOWN



**FRANCIS ST 2008**

114 BARBARA WOZNIAK  
115 KEVIN BROWN  
118 MARY JOYCE  
121 THOMAS REALE  
122 CHRISTOPHER AHLGREN  
125 CYNTHIA WOLCOTT  
128 STEFFAN YEZIK  
130 OCCUPANT UNKNOWN  
131 SUSAN FREDERICK  
134 ELEANOR GODWAY  
135 ROY RIGGINS  
138 GERTRUDE KOWALCZYK  
141 GLORIA EMEGWALI  
142 MARTIN GRZYB  
145 ADRIAN CREPLINSKI  
146 CROSBY W J PLUMBING & HEATING  
WILLIAM CROSBY  
150 KAREN KANAPLE  
156 BARBARA HART

**PAUL MANAFORT DR 2008**

55	BOARD FOR STATE ACDMC AWRDS CHARTER OAK STATE COLLEGE EDUCATION CT STATE DEPT OF
89	KANE KHAMPHOUVONG
95	AMMA OSAFO JUDITH BADRIGIAN LAURIE ZEMBKO
101	KEJUAN DILLARD
109	OCCUPANT UNKNOWN
115	DIANE MARTINO K OROURKE KATIE DARROW LAN CRANSTON S DANDREA S FLANAGAN T COSTA
145	OCCUPANT UNKNOWN
274	ANDREW THORP CALEB NEVES DAVID TYRIE HECTOR REYOSO J MORIARTY JASON DILLESBROW JENNIFER HAMEL KARINA GALARAZA MANII STEPHENSON N ALLEGRO
305	JUAN NADAL
315	MATT WISNIEWSKI
321	KATHRYN ELLIS MITCHELL GRAHAM SUZANNE GANEM
329	AARON ZONONI

**FRANCIS ST 2003**

18 OCCUPANT UNKNOWN  
114 CAROL MORANO  
115 KEVIN BROWN  
118 DONALD JOYCE  
121 MARGARET ALOISI  
122 ERICA CHRISTOPOULOS  
125 THOMAS KELLY  
128 LOUIS ROGERS  
129 STEFAN URBANSKI  
130 SHIRLEY ODDI  
131 SUSAN FULLER  
134 ELEANOR GODWAY  
135 ROY RIGGINS  
138 GERTRUDE KOWALCZYK  
141 GLORIA EMEGWALI  
142 ANNA GRZYB  
145 OCCUPANT UNKNOWN  
146 OCCUPANT UNKNOWN  
150 PAUL GAWEL

**PAUL MANAFORT DR 2003**

55	CHARTER OAK STATE COLLEGE
89	KANE KHAMPHOUVONG
101	SCOTT RICHARDSON
109	ALFRED CURRAN
115	K OROURKE T COSTA
145	OCCUPANT UNKNOWN
274	ADAM PALLONE AKI UCHIDA ALICIA MCKNIGHT ANDRE DOWNES ANESDO LLC B KAGAN COLLEEN STEWART DONNA DUBE GUY CRUNDWELL JASON DILLESBAY JENNIFER HAMEL JOHN FRAZIER JULIUSZ KOSTECKI KEVIN BOOKER KEVIN QUINN LAURA CURRIER MATTHEW RENNIE NATHAN MEADE NEIL VANE PATRICK SELLERS SARA WATERS
305	ANDREW DAIGLE
309	LESLIE GIACCO
315	OCCUPANT UNKNOWN
321	ALI TATARI GILBERT DEROSIER JOSEPH GORNEAULT MITCHELL GRAHAM
329	OCCUPANT UNKNOWN

**FRANCIS ST 1999**

114 NORMAN KIRBY  
115 LOUIS ROBERTS  
118 DONALD JOYCE  
121 M ALOISI  
122 PAULA RAPOSO  
125 THOMAS KELLY  
128 OCCUPANT UNKNOWN  
129 STEFAN URBANSKI  
130 SHIRLEY ODDI  
131 IDA ABRAHAMSON  
134 ELEANOR GODWAY  
135 ROY RIGGINS  
138 GEORGE KOWALCZYK  
141 OCCUPANT UNKNOWN  
142 FRANK GRZYB  
145 OCCUPANT UNKNOWN  
146 OCCUPANT UNKNOWN  
150 PAUL GAWEL  
156 BARBARA HART

**PAUL MANAFORT DR 1999**

89	JAMES KARAM
95	SCOTT HURD
101	OCCUPANT UNKNOWN
109	ALFRED CURRAN
115	MELISSA ZULLO
274	BARRY WESTCOTT
	CRAIG WHALEN
	DEBORAH APPELLE
	DEBRA MARSLAND
	K YOERKIE
	NICOLE BURNHAM
	WILLIAM COLOGNE
305	SEAN CONWAY
309	OCCUPANT UNKNOWN
315	N GRUTTADAURIA
321	GILBERT DEROSIER
	J GORNEAULT

**FRANCIS ST 1992**

115	ROBERTS, LOUIS M
118	JOYCE, DONALD E
121	ALOISI, M
122	FERONE, SOPHIE
129	URBANSKI, STEFAN E
130	ODDI, SHIRLEY
131	ABRAHAMSON, MAX
135	RIGGINS, ROY
138	KOWALCZYK, G
141	BERBERIAN, ROBERT
142	GRZYB, F
145	STARZYK, MICHAEL

## FRANCIS ST 1985

## FRANCIS

FROM 96 SEFTON DR W BEYOND  
GRANDVIEW TO 388 EDDY GLOVER  
BLVD ZIP CODE 06053  
STANLEY ST CROSSES

114 RESNICK Frank@ 225-7134  
115 THOMPSON Otis A@ 225-1809  
118 JOYCE Donald E@ 223-4567  
118 JOYCE James J 223-4567  
118 PARADIS Karen 223-4567  
121 ALOISI Margaret O@ 229-6369  
122 MARK'S TV &  
ANTENNA SERVICE 225-2479  
125 BECKER Michael K@ 229-6183  
125 BECKER Sean M 229-6183  
126 No Information

## FRANCIS CT BEGINS

128 KLAJE Paul E Jr@ 229-7860  
129 URBANSKI Stefan E@ 223-8368  
131 ABRAHAMSON Ida B@ 224-1322  
134 No Information  
135 KOCZERA L 224-1196  
135 RIGGINS Roy S@ 223-7051  
138 KOWALCZYK Gertrude@ 225-5105  
141 BERBERIAN Michele M 223-7589  
141 BERBERIAN Nicole M 223-7589  
141 BERBERIAN Robert N@ 223-7589  
142 TAGORA Czeslaw@ 224-7558  
145 STARZYK Hellen S 229-2839  
145 STARZYK Leo E 229-2839  
145 STARZYK Sophie A@ 229-2839  
146 ECKERT Bruce 229-2472  
146 NOURY Norman M@ 229-2472

## PARK DR BEGINS

150 No Information  
156 HART Barbara M@ 223-0006  
156 HART Robert 223-0006  
156 HART William H 223-0006  
156 MAKUCH Josephine 223-0006  
157 DOW Earl M Jr@ 225-7362  
162 CALLAHAN Marguerite M Sr@ 229-0580  
163 APICHINO Mary@ 229-0864  
166 No Information  
167 DeCHESSER Louise@ 225-0426  
170 CASSELLA Joseph E Jr@ 225-3769  
171 DURAN Gary A@ 225-1905  
174 PAPPALARDO Anthony F@ 224-9878  
175 RAU Delbert H@ 229-1000  
178 PERUZZI Santo@ 229-0794  
179 BOMBACI Vincent S@ 223-1358  
182 DEREWONKO Alexander@ 225-4719  
182 DEREWONKO Jack 225-4719  
183 NORTON Jeffrey L@ 223-3098  
183 PELLETIER Wolende 223-3098  
183 SOULARD Paul E 223-3098  
186 FREDETTE Charles G 225-9175  
189 TARICANI Edwin C@ 229-8496  
192 CENATE Paul G@ 229-6930  
197 ISSAKHANI Ruben@ 224-8736  
197 SHAMASH Sarah 224-8736  
200 JOHNSON Frederick E@ 225-0289  
200 JOHNSON Nora 225-0289

## CARLTON ST CROSSES

227 RUSSELL Donald L 225-4336  
227 RUSSELL Viola E@ 225-4336  
233 COPE Carol J 224-8866

## ROXBURY RD ENDS

239 No Information  
247 BRIGHENTI Percy J@ 225-6869  
255 PIENKOS Frank S@ 229-1971  
255 PIENKOS Linda A 229-1971  
263 SAVICKAS Helen M@ 229-4975  
272 PINETTE Larry L 224-9228  
280 Refused Information@ 223-0503

## PEQUOT ST ENDS

286 SEJERMAN George F@ 827-0220  
294 TRYKOWSKI Andrew A@ 223-5459  
294 TRYKOWSKI Jennifer M 223-5459  
294 TRYKOWSKI Jessica L 223-5459  
300 GROMAN Hariett S@ 229-2292  
305 GOULD Cathy M  
308 GIANNINOTO Sebastian T 224-3826  
315 HADVAB Michael@ 229-0181  
316 CALCINARI Leo J 229-2922  
316 CALCINARI Mary P@ 229-2922

## JACKSON ST ENDS

323 VENTO Anacleta@ 225-0062  
323 VENTO Vincent 225-0062  
329 GORZOCH Michael G@ 225-5631  
330 VERZULLI John D@ 229-3845  
335 No Information  
340 FIALKOWSKI Fred F@ 224-6881  
341 No Information  
347 ZARESKI Joseph@ 225-6773



## FRANCIS ST 1985

353 SLYSZ Mark J.....229-40  
 353 SLYSZ William B®.....229-40  
 354 SZYLOBRYT Eva.....223-2205  
 354 SZYLOBRYT Matthew.....223-2205  
 354 SZYLOBRYT Stanley®.....223-2205

**GRANDVIEW ST ENDS**

359 SLYSZ Stanley F®.....223-5644  
 379 BARBUTO Isabella C®.....225-3995  
 379 BARBUTO Mary Ann.....225-3995  
 379 BARBUTO Nancy N.....225-3995  
 385 No Information  
 386 LIBERA Stanley®.....224-1309  
 387 No Information  
 393 McCROHAN James®.....225-8219  
 394 No Information  
 400 WAGNER Russell J®.....229-2760  
 405 STEFENS Darius.....225-1732  
 405 STEFENS Edward®.....225-1732  
 408 GRENZINSKI Edward A®.....223-7778  
 409 DREZEK Eugene®.....224-2247  
 414 SKRZYPCZAK Joseph H®.....229-0112  
 415 No Information  
 419 ARCIDIACONO John F®.....223-7463  
 422 McCARTHY Mark®.....223-1495  
 425 TIBBETTS Carolyn E®.....224-8598

**FRANCIS CT**

**FROM 127 FRANCIS N TO DEAD END  
 ZIP CODE 06053**

10 YESSIAN Jennie ®.....229-3143

## FRANCIS ST 1976

1976 - THE PRICE	
FRANCIS FR 96 SEFTON DR W BEY GRANDVIEW TO 388 EDDY GLOVER BLVD /RIGHT ODD/ /IRREGULARLY NUMBERED/ ZIP CODE 06053	
18	SHER IRENE K MRS * 223-6951
24	VACANT
30	RABIS MARTIN J * 223-5666
54	VAN GORDEER ALDEN A * 223-4017
64	VACANT
- 93 STANLEY ST CROSSES	
114	JONES CHARLES JR 223-1862
115	VACANT
118	JOYCE DONALD 223-4567
121	O NEIL WILLIAM J * 229-6329
122	FERONE MICHAEL S *
125	BECKER MICHAEL 229-6183
126	VACANT
- 127 FRANCIS CT BEGINS	
129	URBANSKI STEFAN E * 223-8368
130	VACANT
131	ABRAHAMSON MAX * 224-1322
134	RIPPLE ROLAND H * 229-C791
135	BROWN WILLIAM G * 229-7548
138	KOWALCZYK STANLEY * 225-4832
141	BERBERTIAN ROBERT N * 223-7589
142	BENNION DONALD H * 223-4139
145	STARZYK MICHAEL W * 229-2839
146	NOURY NORMAN H *
- 149 PARK DR BEGINS	
150	WOJCIK VINCENT J * 225-9250
156	HART BARBARA M 223-0096
157	HALL SHIRLEY J * 229-2101
162	CALLAHAN * 229-0580
163	MARGUERITE MRS APICCHINO LUCY L MRS * 229-0864
166	D ONOFRIO HENRY J * 229-9994
167	MANGAN WILLIAM F 3D 225-0426
170	LA VALLEY SARAH V MRS * 225-8905
171	BELL LORETTA M MRS * 229-1421
174	PAPPALARDO ANTHONY F * 224-9878
175	RAU DELBERT H * 229-1000
178	PERUZZI SANTO * 229-C794
179	BOMBACI VINCENT S * 223-1358
182	DEREWONKO ALEX * 225-4719
183	PRZYBYTEK JOHN 229-8182
186	KULAK MARY C MRS * 229-2831
189	TARJACANT EDWIN C * 229-8496
192	CENATE PAUL G * 229-6930
197	SELEDYN STANLEY E * 229-2680
200	JOHNSON FREDERICK E * 225-0289
201	BAYPAMIAN SHEPEN MRS * 224-1755
- 203 CARLTON ST CROSSES	
227	RUSSELL VIOLA E MRS 225-4336
233	COPE CAROL J 223-0726
- 234 ROXBURY RD ENDS	
239	RICKBORN RUDOLPH * 223-4888
247	BRIGHENTI PERCY J * 225-6869
255	PIENKOS FRANK S * 229-1971
263	SAVICKAS HELEN M MRS * 229-4975
272	SALERNO FRANK F * 229-5752
280	VACANT
- 283 PEQUOT ST ENDS	
286	SEJERMAN GEORGE F
294	TRYKOWSKI ANDREW A * 223-5459
300	GROMAN HENRY G * 229-2292
305	REFUSED INFO
308	GIANNINOTO SABASTIAN * 225-9879
315	HADVAB MICHAEL * 229-0181
316	CALCINATI MARY P MRS * 229-2922
- 320 JACKSON ST ENDS	
323	VENTO ANACLETO * 225-0067
329	VACANT
330	VERZULLI JOHN D * 229-3845
335	TANGUAY PHILIP J * 223-6849
340	FIALKOWSKI FRED F INSURANCE AGENCY 223-6849
	FIALKOWSKI FRED F * 223-6849
341	GURSKI HENRY A * 225-6027
347	ZARESKI JOSEPH * 225-6773

## FRANCIS ST 1976

RICE & LEE CO'S		
353	SLYSZ WILLIAM B	* 229-4045
354	DYGLUS WALTER T	* 223-8437
- 356 GRANDVIEW ST ENDS		
359	SLYSZ STANLEY F	* 223-5644
369	VACANT	
371	KRYSZAK HENRY	225-4268
386	LIBERA STANLEY	* 224-1309
387	MILLER DAVID W	* 224-0411
393	APZYLOWICZ JOSEPH A	
		* 229-0627
394	LABAS MICHAEL JR	* 229-9842
399	KREDAR BERTHA S MRS	
		* 229-6949
400	WAGNER RUSSELL J	* 229-2760
408	REFUSED INFO	
414	SKRZYPCZAK JOSEPH	
		229-0112
415	DASENBROCK ARTHUR A	
419	ARCIDIACONO JOHN F	
		* 223-7463
422	VACANT	
425	VASILE CORRADO P	* 225-1809
- - - - -		
FRANCIS CT FR 127 FRANCIS N TO DEAD END /RIGHT ODD/ ZIP CODE 06053		
10	YESSIAN HENRY	* 229-3163
15	VACANT	
16	LANDON JUDSON S	* 229-7060
- - - - -		
FRANKLIN FR 155 1/2 ELM E TO 782 STANLEY /RIGHT ODD/ ZIP CODE 06051		

FRANCIS ST 1972

93 NORVILL VICTOR A \* 223-2582  
 99 GEBALA ANTHONY J \* 229-2633  
 105 VARFOL MICHAEL G \* 223-7683  
 111 BRAINARD ERNEST T  
 \*

- 112 RECANO RD BEGINS

- - - - -

FRANCIS FR 96 SEFTON DR W BEY  
 GRANDVIEW TO 388 EDDY GLOVER  
 BLVD /RIGHT ODD/ /IRREGULARLY  
 NUMBERED/ ZIP CODE 06053

18 SHER IRENE K MRS \* 223-6951  
 24 VACANT  
 30 RABIS MARTIN J \* 223-5666  
 34 VACANT  
 54 VAN GORDER A A \* 223-4017  
 64 VACANT

## FRANCIS ST 1972

- 93 STANLEY ST CROSSES		
114	JONES CHARLES JR	223-1862
115	THOMPSON A A MRS	224-0784
118	MAFREY THOMAS H	224-3855
121	D NEIL WILLIAM J *	224-6369
122	PERONE MICHAEL S *	225-2479
125	LA FONTAINE GEORGE M	
		* 223-0507
126	VACANT	
- 127 FRANCIS CT BEGINS		
129	URBANSKI STEFAN E	
		* 223-8368
130	ODDI PATSY A	*
131	ABRAHAMSON MAX	* 224-1322
134	RIPPLE ROLAND H	* 225-0791
135	BROWN WILLIAM G	* 224-7548
138	KOWALCZYK STANLEY	
		* 225-4832
141	BERBERIAN ROBERT N	
		* 223-7589
142	BENNTON DONALD H	* 223-4139
145	STARZYK M W	* 224-2839
146	NOURY NORMAN M	*
- 149 PARK DR BEGINS		
150	WOJCIK VINCENT J *	225-9250
156	HART BARBARA S	223-0006
157	HALL SHIRLEY J	224-2101
162	CALLAHAN JOHN F	* 224-0580
163	APICCHINO LUCY L MRS	
		* 224-0864
166	D GAOFRIO HENRY J	
		* 224-9994
167	KRATZKE PAUL	* 224-5389
170	LA VALLEY S V MRS	
		* 225-8905
171	BELL LORETTA M MRS	
		* 224-1421
174	PAPPALARDO ANTHONY F	
		224-0878
175	RAU DELBERT H	* 225-1000
178	PERLZZI SANTO	* 224-0794
179	BOMBACI VINCENT S	
		* 223-1358
182	DEREWONKU ALEX	* 225-4719
183	PRZYBYTEK JOHN	224-8182
186	KULAK MARY C MRS	* 224-2831
189	TARICANI EDWIN C	* 224-8496
192	CENATE PAUL G	* 224-6930
197	SELEDYN STANLEY E	
		* 224-2680
200	JOHNSON FREDERICK E	
		* 225-0289
201	BAYRAMIAN AMRAN	* 224-1755
- 203 CARLTON ST CROSSES		
227	RUSSELL VIOLA E MRS	
		225-4336
233	PETERS F J	* 223-6667
- 234 ROXBURY RD ENDS		
239	PROCKO WILLIAM C *	
247	BRIGHENTI PERCY J	
		* 225-6869
255	PIENKUS FRANK S	* 224-1971
263	SAVICAS HELEN M MRS	
		* 225-4975
272	SALERNO FRANK L	* 224-5752
280	VACANT	
- 283 PEQUOT ST ENDS		
286	SEJERMAN GEORGE F	*
		*
294	TRYKOWSKI ANDREW A	
		* 223-5459
300	GROMAN HENRY G	* 225-2292
305	NO LISTING	
308	GIANNINOTO SABASTIAN	
		* 225-4370
315	HADVAS MICHAEL	* 224-0181
316	CALCINART URBANO	* 224-2922
- 320 JACKSON ST ENDS		
323	VENTO ANCLETO	* 225-0062
329	VACANT	
330	VEPZULLI JOHN D	* 224-3845
	STEFONAVICIUS	224-7886
	WALTER B	
335	TANGUAY PHILIP J *	
340	FIALKOWSKI FRED F	
	INSURANCE AGENCY	223-6849
	FIALKOWSKI FRED F	
		* 223-6849
341	GURSKI HENRY A	* 225-6027
347	ZARESKI JOSEPH	* 225-6773
353	SLYSZ WILLIAM B	* 224-4045
354	DYGLES W T	* 223-8437
- 356 GRANDVIEW ST ENDS		
359	SLYSZ STANLEY F	* 223-5644
369	VACANT	
371	KRYSZAK HENRY	225-4268
386	LISERA STANLEY	* 224-1309
387	MILLER DAVID W	* 224-0411
393	ARZYLWICZ JOSEPH A	
		* 224-0627
394	LABAS MICHAEL JR	* 224-9842

FRANCIS ST 1972

NEW BRITAIN DIR

399 KREDAR BERTHA S MRS \* 229-6949  
 400 WAGNER RUSSELL J \* 229-2760  
 408 NO LISTING  
 414 SKRZYPCZAK JOSEPH 229-0112  
 415 DASENBROCK ARTHUR A \*  
 419 ARCIDIACONO JOHN F \* 223-7463  
 422 TRANCHIDA RICHARD M \* 225-1006  
 425 VASILE CORRADO P \* 225-1809

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 FRANCIS CT FR 127 FRANCIS N TO  
 DEAC END /RIGHT ODD/ ZIP CODE  
 06053

10 YESSIAN HENRY \* 229-3163  
 15 JACKSON W H \* 229-3962  
 16 LANDON J S \* 229-7060

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 FRANKLIN FR 155 1/2 ELM E TO 782  
 STANLEY /RIGHT ODD/ ZIP CODE

## FRANCIS ST 1968

## NEW BRITAIN DI

## FOXON PL (continued)

## 82 AMHERST ST BEGINS

85 COE KATHERINE MRS  
 93 NORVILL VICTOR A □ 223-7503  
 99 GEBALA ANTHONY J □ 223-2582  
 105 VARHOL MICHAEL G □ 223-2633  
 111 BRAINARD ERNEST T  
 □ 223-0331

## 112 RECANO RD BEGINS

FRANCIS FR 96 SEFTON DR W BEY  
 GRANDVIEW TO 388 EDDY GLOVER  
 BLVD /RIGHT ODD/ /IRREGULARLY  
 NUMBERED/ ZIP CODE 06053

1 VACANT  
 7 REMBISZ RAYMOND A  
 12 SHIELDS MICHAEL J □ 223-9167  
 15 VACANT  
 17 VACANT  
 18 SHER IRENE K MRS □ 223-6951  
 21 BOUDREAU MAGLOIRE  
 □ 223-5477  
 BOUDREAU IRVIN G □ 223-9107  
 24 RICH SANFORD E □ 223-2724  
 25 VACANT  
 30 RABIS MARTIN J □ 223-5666  
 34 COFFEY MARY M MRS  
 □ 223-0155  
 39 VACANT  
 44 WARD HULDAH J MRS  
 □ 223-0913  
 50 LARKIN J C  
 54 VAN GORDER A A □ 223-4017  
 64 VENTURA LEONARD □ 223-8017

## 93 STANLEY ST CROSSES

114 FARSAKH USIF S 223-1351  
 115 THORNTON A A MRS 223-0784  
 118 CLOUGH FREIDA □ 223-8587  
 121 D NEIL WILLIAM J □ 223-6369  
 122 FERONE MICHAEL S □ 223-2479  
 125 LA FONTAINE JOHN S  
 □ 223-0507  
 126 D AGOSTINO LOUIS S  
 □ 223-7749  
 D AGOSTINOS OIL  
 SERVICE 223-7237

## 127 FRANCIS CT BEGINS

129 URBANSKI FRANCES  
 130 ODDI PATSY A □ 223-3960  
 131 ABRAHAMSON MAX □ 223-1322  
 134 RITPLE ROLAND H □ 223-0791  
 135 BROWN WILLIAM G □ 223-7548  
 138 VACANT  
 141 BERBERIAN ROBERT H  
 □ 223-7589  
 142 PERCIVAL HOWARD E  
 □ 223-4794  
 145 STARZYK M W □ 223-2839  
 146 NOURY NORMAN H □ 223-2496

## 149 PARK DR BEGINS

150 COLOSIMO PHILIP □ 223-8132  
 156 HART BARBARA S 223-0006  
 157 MALL WILLIAM H □ 223-2101  
 162 CALLAHAN JOHN F □ 223-0580  
 163 APICHIANO LUCY L MRS  
 □ 223-0864  
 166 D ONOFRIO HENRY J  
 □ 223-9994  
 167 KRATZKE PAUL □ 223-5389  
 170 LA VALLEY S V MRS  
 □ 223-8905  
 171 BELL WALTER L □ 223-1421  
 174 RAPP ADOLPH R □ 223-1503  
 175 RAU DELBERT H □ 223-1000  
 178 PERUZZI SANTO □ 223-0794  
 179 BOMBACI VINCENT S  
 □ 223-6108  
 182 SHEILDS M C □ 223-1744  
 183 KNAPP AGNES MRS □ 223-1841  
 186 KULAK MARY C MRS □ 223-2831  
 189 TARICANI EDWIN C □ 223-8496  
 192 CENATE PAUL G □ 223-6930  
 197 SELEDYNI STANLEY E  
 □ 223-2680  
 200 JOHNSON FREDERICK E  
 □ 223-0289  
 201 BAYRAMIAN AMRAK □ 223-1755

## 203 CARLTON ST CROSSES

227 RUSSELL VIOLA E MRS  
 223 PETERS F J □ 223-6667

## 234 ROXBURY RD ENOS

239 PROCKO WILLIAM C □

247 KANIA HENRY S □ 223-4288  
 255 PIENKOS FRANK S □ 223-1971  
 263 SAVICKAS ADOLPH G  
 □ 223-4975  
 272 CUNNINGHAM WALLACE R  
 280 RUBIN BENJAMIN □ 223-1594

## 283 PEQUOT ST ENOS

286 SEJERMAN GEORGE F  
 □  
 294 TRYKOWSKI ANDREW A  
 □ 223-5459  
 300 GROMAN HENRY G □ 223-5129  
 305 BUDNEY S MRS □ 223-6176  
 308 GIANNINOTO S T □ 223-4370  
 315 HADVAB MICHAEL □ 223-0181  
 316 CALCINARI URBANO □ 223-2922

## 320 JACKSON ST ENDS

323 VENTO ANCLETO □ 223-0062  
 329 KUKUCK ROBERT K □ 223-4136  
 330 VERZULLI JOHN D □ 223-3845  
 DAVIS DANE E  
 335 TANGUAY PHILIP J □  
 340 FIALKOWSKI FRED F  
 INSURANCE AGENCY  
 223-6849  
 FIALKOWSKI FRED F  
 □ 223-6849  
 341 GURSKI HENRY A □ 223-6027  
 347 ZARESKI JOSEPH □ 223-6773  
 353 SLYSZ WILLIAM B □ 223-4045  
 354 DYGUS W T □ 223-8437

## 356 GRANDVIEW ST ENDS

359 SLYSZ STANLEY F □ 223-5644  
 386 LIBERA STANLEY □ 224-1421  
 387 MILLER DAVID W □ 224-0411  
 393 ARZYLOWICZ JOSEPH A  
 □ 223-0627  
 394 LABAS MICHAEL JR □ 223-9842  
 399 KREDAR BERTHA S MRS  
 □ 223-6949  
 400 WAGNER RUSSELL J □ 223-2760  
 408 GRENZINSKI EDWARD A  
 □ 223-7778  
 414 VACANT  
 415 DASENBROCK ARTHUR A  
 □ 223-4776  
 419 ARCIDICONO JOHN F  
 □ 223-7463  
 422 VACANT  
 425 VASILE CORRADO P □ 223-1809

FRANCIS CT FR 127 FRANCIS N TO  
 DEAD END /RIGHT ODD/ ZIP CODE  
 06053

10 YESSIAN HENRY □ 223-4613  
 15 JACKSON W H □ 223-3962  
 16 LONDON J S □ 223-7060

FRANKLIN FR 135 1/2 ELM E TO 782  
 STANLEY /RIGHT ODD/ ZIP CODE  
 06051

6 SKARZYNSKI LOUIS W  
 223-2762  
 TETI THEODORE 223-6570  
 ARROYO JUAN  
 VACANT  
 LANGLEY H F MRS 223-7123  
 18 ZITA ROSE A MRS 223-6375  
 WANDA ABRAHAM  
 ZITA ROBERT V 224-1069  
 LENK FRANCES  
 19 OUELLETTE RAOUL J  
 □ 223-6175  
 OAKES ALPHONSE  
 20 PETANO PATRICK □  
 VACANT  
 24 VACANT  
 26 WALKER ROSE A MRS  
 223-8241  
 DYSON JAMES  
 CONWAY EDWARD  
 VACANT  
 27 DE SENO MARY MRS □ 223-0014  
 CASSELLA ROBERT E  
 29 ZIGMUND VICTOR L  
 30 VACANT  
 GRESSEL THOMAS  
 31 MARIANI MARY MRS □ 223-8059  
 MARIANI JOSEPH C 223-8059  
 32 GENOVESE LUCY MRS  
 □ 223-3476  
 33 COMMUNITY GROCERY  
 223-8059  
 37 HARRISON NAMAN  
 WINN ORA MRS 223-5650  
 DYSON JAMES 223-0631  
 WHITE FANNIE M 223-8759  
 KOCHANIK JOHN J □ 223-3097  
 HARRISON ELOISE 223-6698  
 VACANT  
 38 DELGADO LOUIS  
 FORMATO JOHN 223-9382

## FRANCIS ST 1964

1964 - THE PRICE &amp; LEE CO.'S

## FRANCIS

Fr 96 Sefton dr W bey Grandview to  
388 Eddy Glover blvd (Right odd)  
(Irregularly numbered)

1@ Ludko John A BA9-5843  
 @ Ludko Annie Mrs BA9-6307  
 7@ Rembisz Raymond A BA3-9167  
 12@ Shields Michael J BA3-4208  
 15@ Whalen Anna B Mrs BA9-3250  
 17@ Haley Pearl E BA9-5612  
 18@ Sher Benjamin BA3-6951  
 21@ Boudreau Magloire BA9-5477  
 @ Boudreau Irvin G BA9-9107  
 Boudreau K M Mrs nurse

24@ Rich Sanford E BA5-2724  
 29@ Kallberg Ellen A Mrs

BA9-0284  
 30@ Rabis Martin J BA3-5666  
 34@ Coffey Mary M Mrs BA9-0155  
 39@ Varsell C S Mrs BA9-0220  
 43 Sayre L E Rev BA5-2968  
 44@ Ward Fred J BA9-0913  
 49@ Jobert Arthur H BA9-5351  
 50@ Parker Warren F BA9-5206  
 53@ Johnson J Warner BA9-2166  
 54@ VanGorder A A BA3-4017  
 59@ Johnson E Walter BA9-3338  
 63 Hickox Howard F BA9-4567  
 Cote Romeo R Jr BA5-6298  
 64@ Ventura Leonard BA5-7367  
 65@ Ritoli John F BA9-3163

## 93 STANLEY ST crosses

114@ Ahlquist Russell W BA9-9924  
 115 Thornton A A Mrs BA9-0784  
 118@ Morse Sarah A Mrs BA9-5538  
 121@ O'Neil William J BA9-6389  
 122@ Landon Mabel E Mrs BA9-4134  
 125 LaFontaine John S BA3-0507  
 126 D'Agostino Louis S

## 127 FRANCIS CT begins

129@ Cooley Harry L BA9-2126  
 130@ Knull S H Rev BA9-4070  
 131@ Abrahamson Max BA4-1322  
 134@ Ripple Roland H BA9-0791  
 135@ Brown William G BA9-7548  
 138@ Elliot E M BA3-7583  
 141@ Power Anna Mrs BA5-3027  
 142@ Percival Howard E BA3-4794  
 145@ Starzyk M W BA9-2839  
 146@ Spalter Paul F BA9-7314

## 149 PARK DR begins

150@ Kominos Gustave BA3-5137  
 156@ Bunce Lottie T Mrs BA9-0618  
 157@ Hall William H BA9-2101  
 162@ Callahan John F BA9-0580  
 163@ Apichino Salvatore BA9-0864  
 166@ Gerrish E S Mrs BA9-5446  
 167@ Kratzke Paul BA9-5389  
 170@ LaValley S V Mrs BA9-8905  
 171@ Bell Walter L BA9-1421  
 174@ Rapp Adolph R BA9-1503  
 175@ Rau Delbert H BA9-1000  
 178@ Peruzzi Santo BA9-0794  
 179 Bombaci Vincent S BA3-6108  
 182@ Shields M C BA9-1744  
 183@ Knapp Agnes Mrs BA9-1841  
 186@ Kulak Joseph S BA9-2831  
 189@ Taricani Edwin C BA9-8496  
 192@ Cenate Paul G BA9-6930  
 197@ Seledyn Stanley E BA9-2680  
 200@ Johnson Frederick E BA5-0289  
 201@ Bayramian Amrak BA4-1755

## 203 CARLTON ST crosses

227 Russell Viola E Mrs BA5-4336  
 233@ Peters F J BA3-6667

## 234 ROXBURY RD ends

239@ Procko C William BA9-6771  
 247@ Kania Henry S BA3-4288  
 255@ Pienkos Frank S BA9-1971  
 263@ Savickas Adolph G BA9-4975  
 272 Thomas Richard J BA5-7002  
 280@ Rubin Benjamin BA5-1594

## 283 PEQUOT ST ends

286@ Sejerma George F  
 294@ Trykowski Andrew A BA3-5459  
 300 Groman Henry G BA3-5129  
 305@ Budney S Mrs BA9-6167  
 308@ Gianninoto S T BA5-4370  
 315@ Hadvab Michael BA9-0181

316@ Calcinari Urbano BA9-2922

## 320 JACKSON ST ends

323@ Vento Ancleto BA5-0062  
 329@ Kukuck Robert K BA3-4136  
 330@ Verzulli John D BA9-3845  
 335@ Tanguay Philip J BA5-6512  
 340 Fialkowski Fred F Insurance  
 Agency BA3-6849  
 @ Fialkowski Fred F BA3-6849  
 341@ Gurski Henry A BA5-6027  
 347@ Zareski Joseph BA5-4952  
 353@ Slys William B BA9-4045  
 354@ Dygus W T BA3-8437

## 356 GRANDVIEW ST ends

359@ Slys Stanley F BA3-5644  
 386@ Libera Stanley BA9-6024  
 393@ Arzyłowicz Joseph A BA9-0627  
 394@ Labas Michael Jr BA9-9842  
 399@ Kredar Charles BA9-6949  
 400@ Wagner Russell J BA9-2760  
 408@ Grenzinski Edward A BA3-7778  
 414@ Drag Martin BA9-4103  
 415@ Dasenbrock Arthur A BA5-4776  
 419@ Arcidicono John F BA3-7463  
 422@ Rozansky T J BA9-6294  
 425@ Vasile Corrado P BA5-1809

## FRANCIS CT

Fr 127 Francis N to dead end (Right  
odd)

10@ Yessian Henry BA9-4613  
 15@ Jackson W H BA9-3962  
 16@ Landon J S BA9-7060

## FRANKLIN

Fr 155 1/2 Elm E to 782 Stanley (Right  
odd)

6 Skarzynski Louis W BA5-2762  
 Teti Theodore BA5-6570  
 Fiorillo Francesco BA4-1010  
 Levasseur Bertram E BA5-3218  
 Skinger Joseph W BA9-9653  
 Finkowski John E BA3-9131  
 18 Zita Rose A Mrs BA3-6375  
 Warda Abraham BA4-1069  
 Zita Robert V BA3-8237  
 Lenk Frances BA9-6175  
 19 Ferrara John BA3-8237  
 @ Ouellette Raoul J BA9-6175  
 20 Duffy Robert E BA3-1730  
 @ Petano Angeline Mrs  
 24 Vacant  
 26 Walker Rose A Mrs BA9-8241  
 Garner Nathaniel  
 Dyson James BA5-0631  
 Whistant Clyde  
 27@ DeSeno Mary Mrs BA9-0014  
 Cassella Robert E BA5-1363  
 29 Cugno Frank P BA9-9728  
 30 Genovese Anthony BA5-2508  
 30 Carino Carmino BA5-2904  
 31@ Marieni Mary Mrs BA3-8059  
 Marieni Joseph C BA3-8059  
 32@ Genovese Lucy Mrs BA5-3476  
 Misiorski Donald H BA5-0248  
 33 Community Grocery BA3-8059  
 37 Gotowala Gerald S BA5-3097  
 @ Kochanik John J BA9-6698  
 Harrison Eloise  
 Vacant  
 Williams Annie Mrs BA3-2101  
 Purdie Mattie Mrs BA3-2101  
 New Britain Garment Co BA5-2143  
 38 Delgado Louis BA9-9382  
 Formato John  
 38r New Britain Garment Co Inc BA5-2143  
 48 Calvo's Auto Body BA9-5419  
 Liistro Ernest P BA3-7924  
 Liistro Joseph F BA4-2001  
 51@ Casa Annie Mrs BA3-6425  
 Casa Joseph J  
 Arigno Sebastian  
 Jacobs Kathryn M Mrs  
 55 Shurberg & Sons Inc scrap iron BA9-4817



**APPENDIX IV**

**HISTORICAL TOPOGRAPHIC MAPS**

Proposed Parking Garage

55 Paul Manafort Drive

New Britain, CT 06053

Inquiry Number: 5027979.4

August 21, 2017

## EDR Historical Topo Map Report

with QuadMatch™



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

# EDR Historical Topo Map Report

08/21/17

**Site Name:**

Proposed Parking Garage  
55 Paul Manafort Drive  
New Britain, CT 06053  
EDR Inquiry # 5027979.4

**Client Name:**

Leggette, Brashears & Graham  
4 Research Drive, Suite 204  
Shelton, CT 06484  
Contact: Michael Susca



EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Leggette, Brashears & Graham were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDR's Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

**Search Results:****Coordinates:**

<b>P.O.#</b>	DASCCS	<b>Latitude:</b>	41.6882 41° 41' 18" North
<b>Project:</b>	DASCCS	<b>Longitude:</b>	-72.768698 -72° 46' 7" West
		<b>UTM Zone:</b>	Zone 18 North
		<b>UTM X Meters:</b>	685695.98
		<b>UTM Y Meters:</b>	4617563.82
		<b>Elevation:</b>	162.03' above sea level

**Maps Provided:**

2012	1906
1992	1893
1984	1892
1972, 1973	
1964, 1966	
1952, 1953	
1946	
1944, 1946	

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## Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 2012 Source Sheets

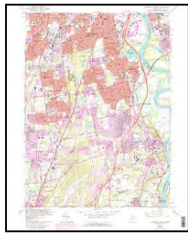


New Britain  
2012  
7.5-minute, 24000



Hartford South  
2012  
7.5-minute, 24000

### 1992 Source Sheets

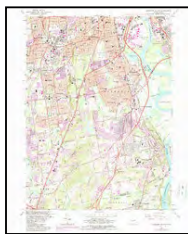


Hartford South  
1992  
7.5-minute, 24000  
Aerial Photo Revised 1991

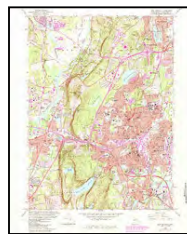


New Britain  
1992  
7.5-minute, 24000  
Aerial Photo Revised 1991

### 1984 Source Sheets



Hartford South  
1984  
7.5-minute, 24000  
Aerial Photo Revised 1982



New Britain  
1984  
7.5-minute, 24000  
Aerial Photo Revised 1982

### 1972, 1973 Source Sheets



Hartford South  
1972  
7.5-minute, 24000  
Aerial Photo Revised 1972



New Britain  
1973  
7.5-minute, 24000  
Aerial Photo Revised 1972

## Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1964, 1966 Source Sheets



Hartford South  
1964  
7.5-minute, 24000  
Aerial Photo Revised 1941



New Britain  
1966  
7.5-minute, 24000  
Aerial Photo Revised 1941

### 1952, 1953 Source Sheets



Hartford South  
1952  
7.5-minute, 24000  
Aerial Photo Revised 1952



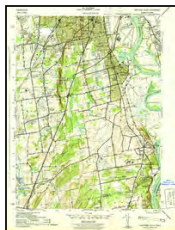
New Britain  
1953  
7.5-minute, 24000  
Aerial Photo Revised 1951

### 1946 Source Sheets

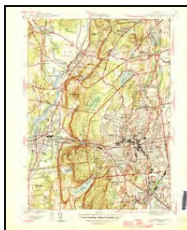


NEW BRITAIN  
1946  
7.5-minute, 25000

### 1944, 1946 Source Sheets



Hartford South  
1944  
7.5-minute, 31680

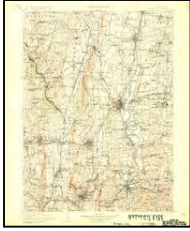


New Britain  
1946  
7.5-minute, 31680

## **Topo Sheet Key**

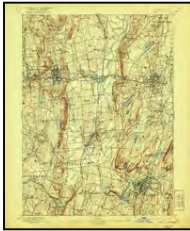
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

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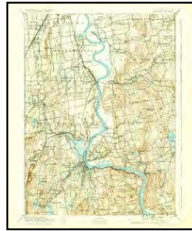


Farmington  
1906  
30-minute, 125000

### **1893 Source Sheets**



Meriden  
1893  
15-minute, 62500

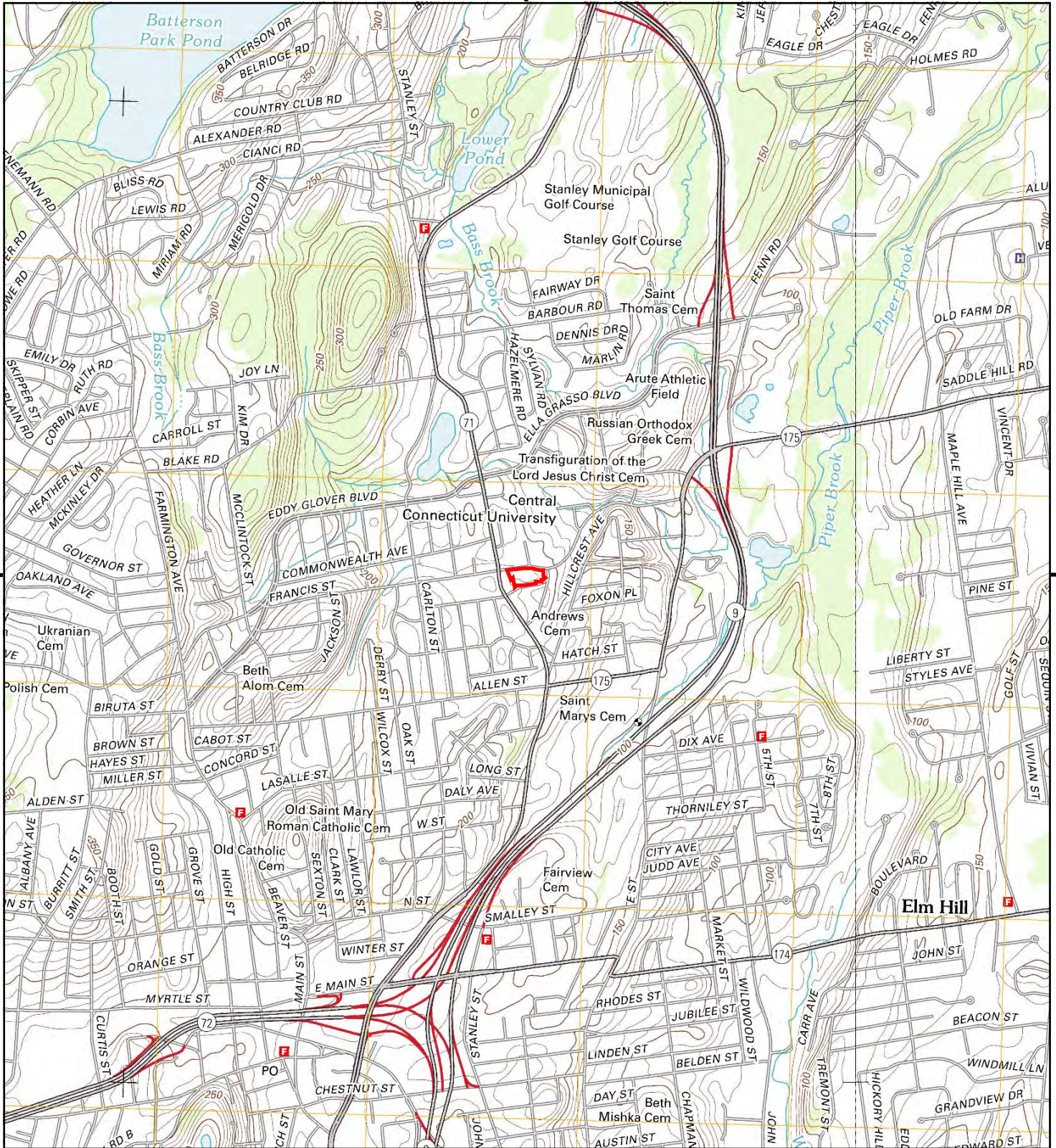


Middletown  
1893  
15-minute, 62500

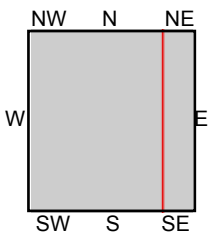
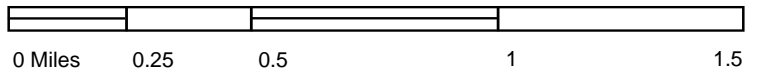
### **1892 Source Sheets**



Meriden  
1892  
15-minute, 62500



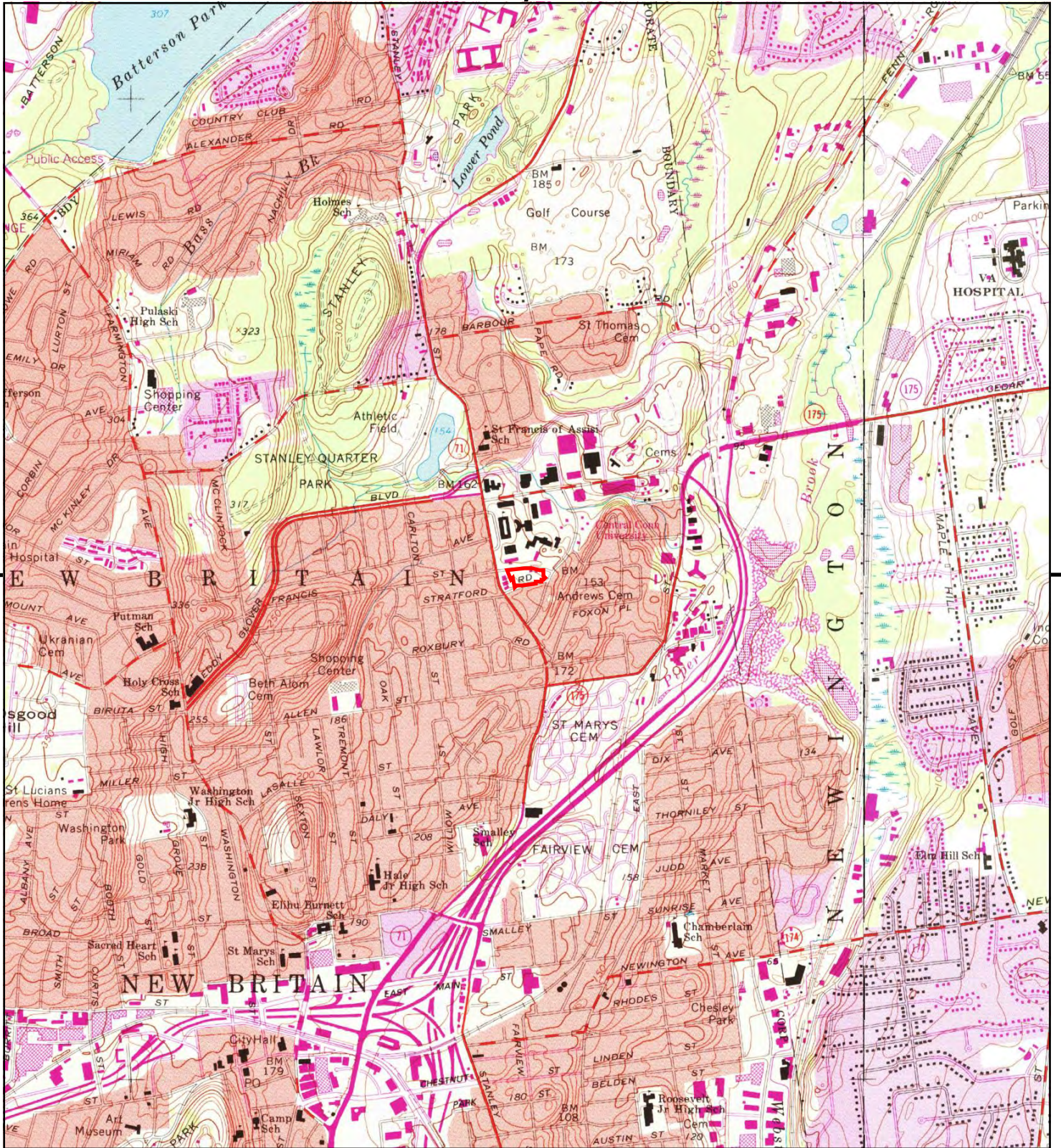
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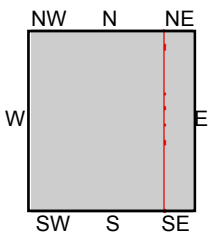
TP, New Britain, 2012, 7.5-minute  
E, Hartford South, 2012, 7.5-minute

**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham





This report includes information from the following map sheet(s).

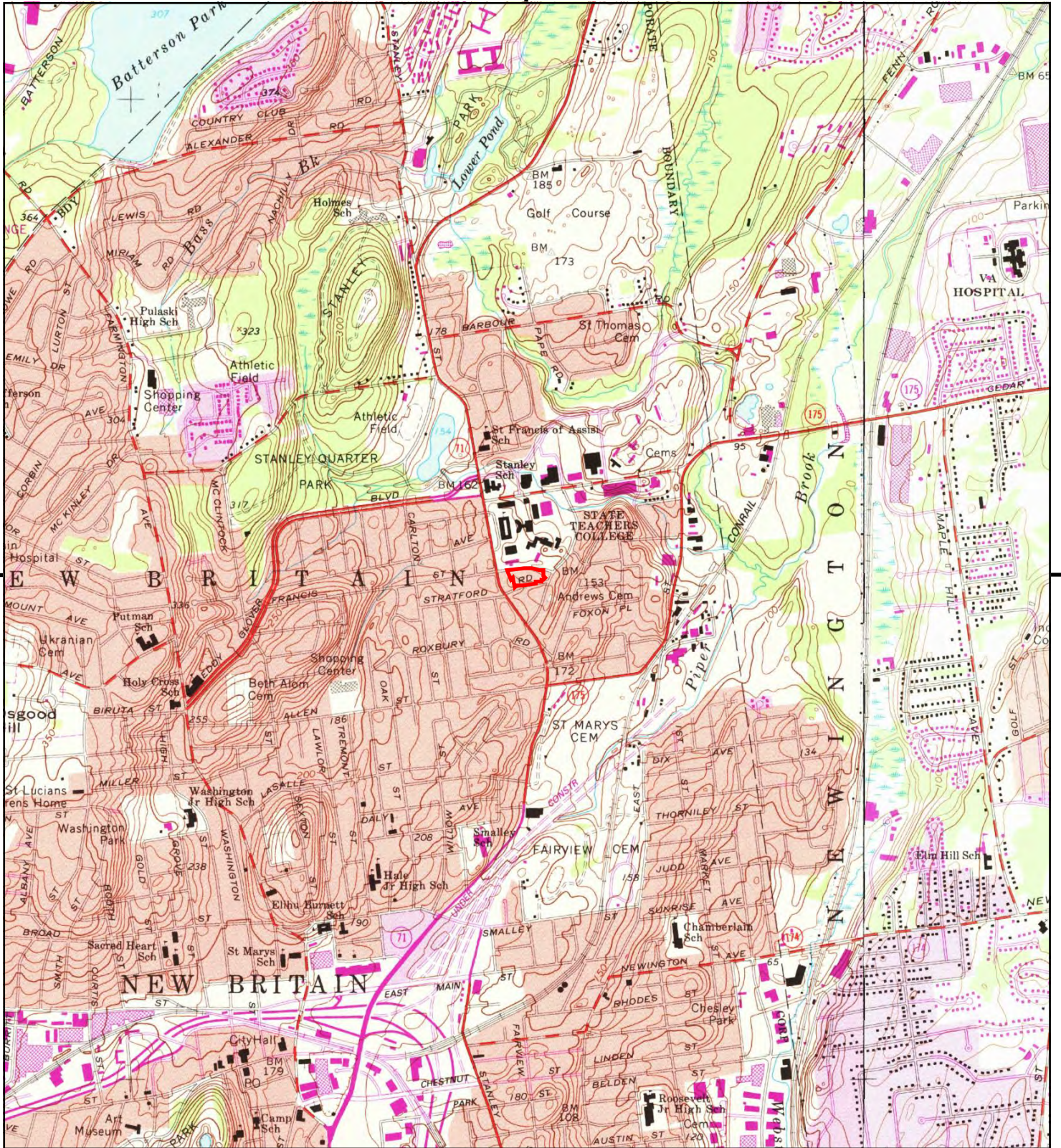


TP, New Britain, 1992, 7.5-minute  
E, Hartford South, 1992, 7.5-minute

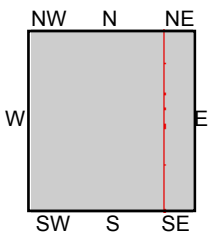
**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham







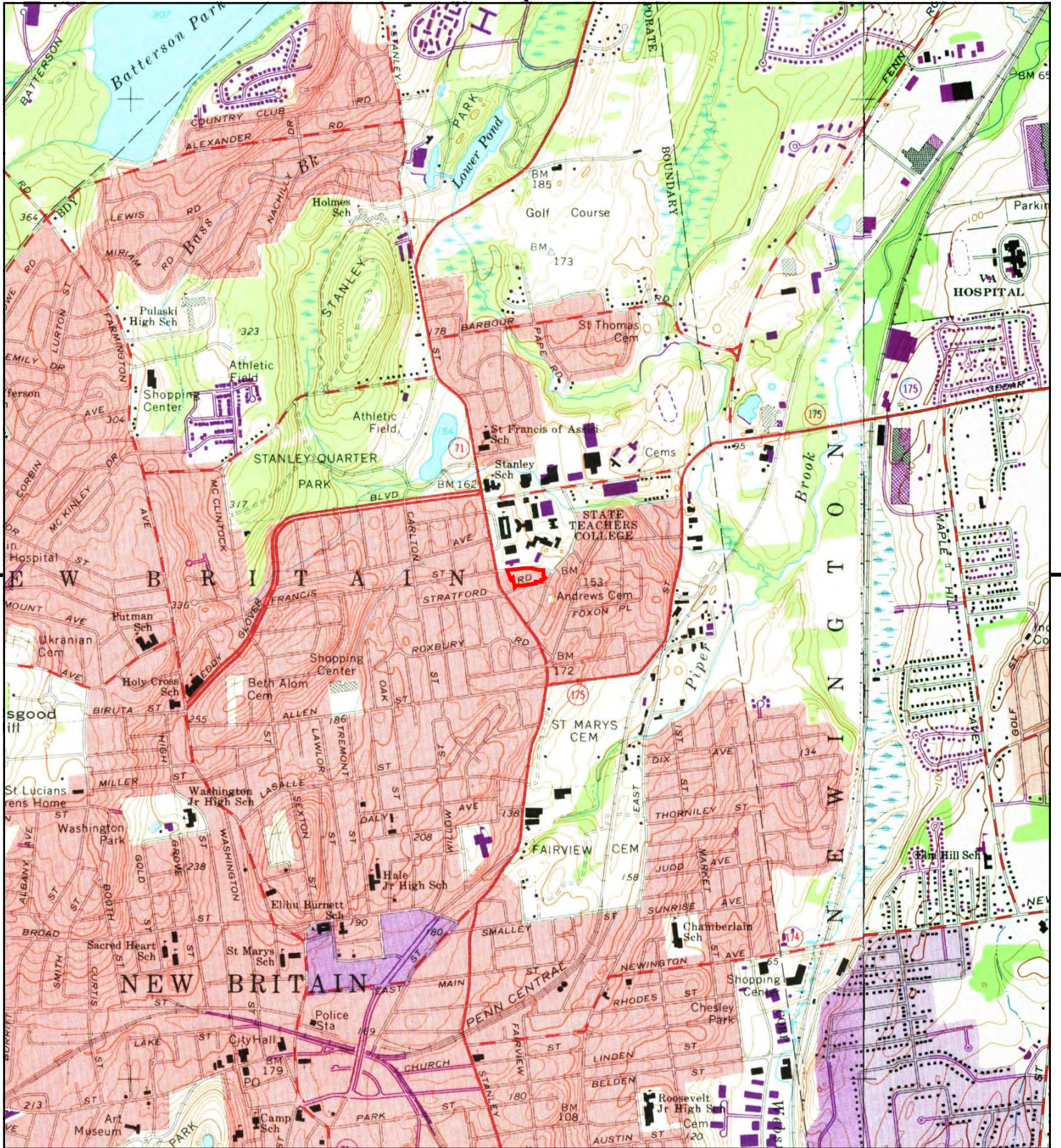
This report includes information from the following map sheet(s).



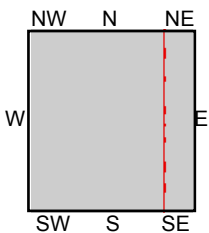
TP, New Britain, 1984, 7.5-minute  
E, Hartford South, 1984, 7.5-minute

**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham





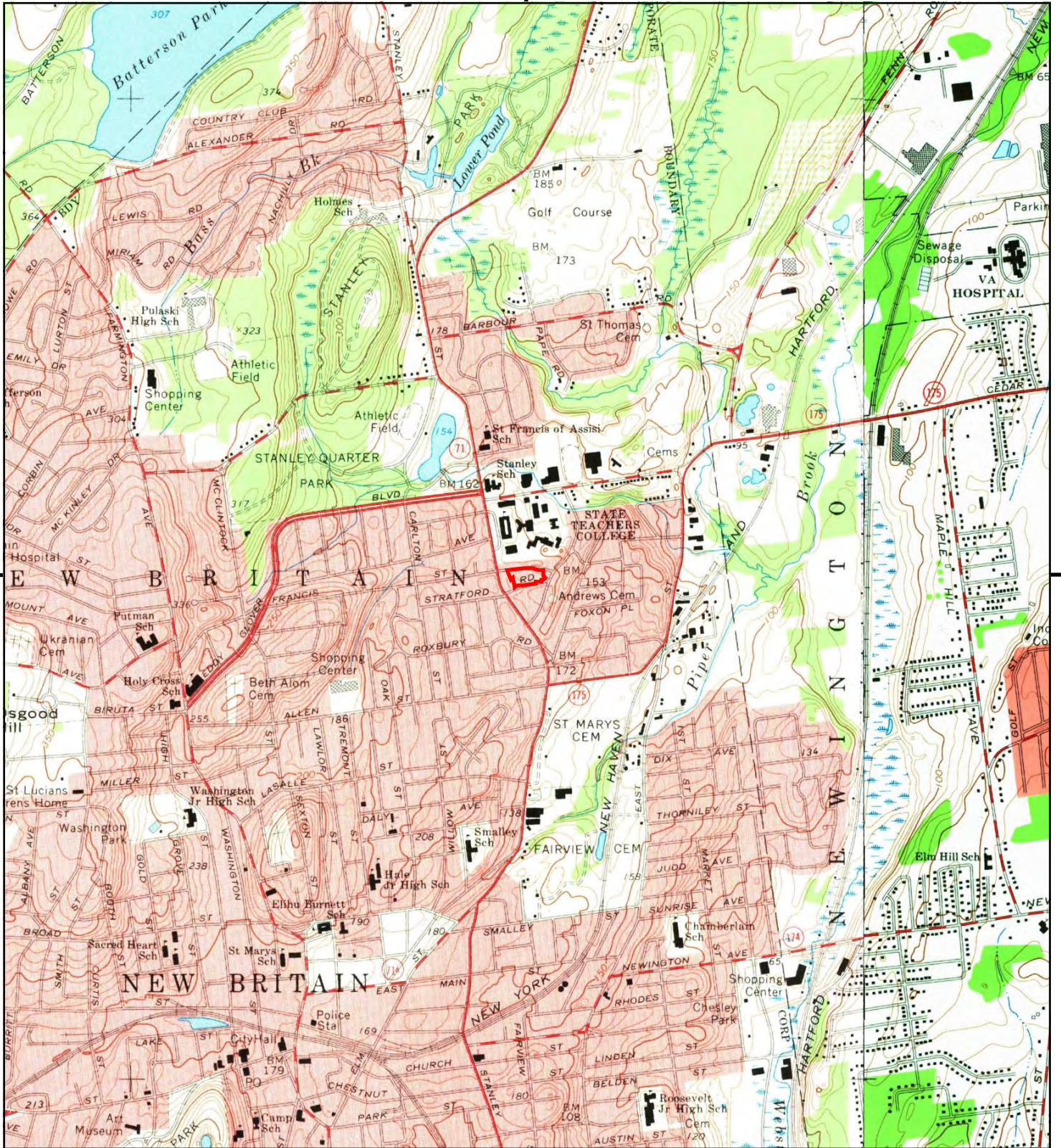
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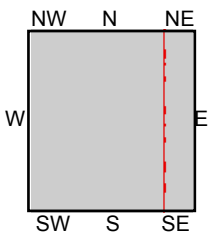
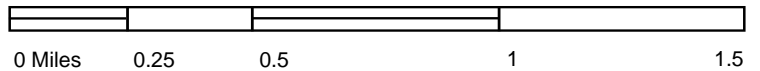
TP, New Britain, 1973, 7.5-minute  
E, Hartford South, 1972, 7.5-minute

**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham





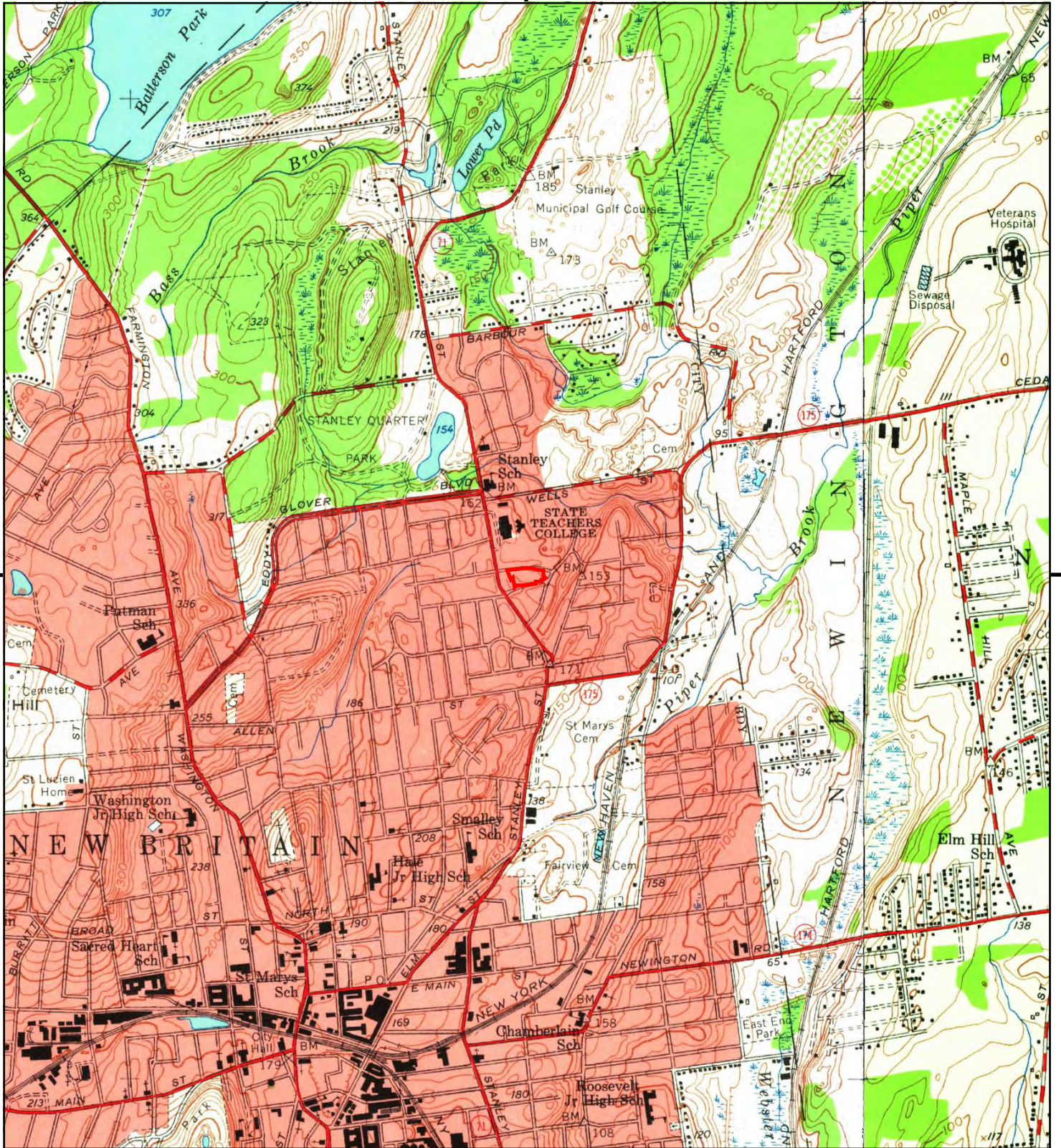
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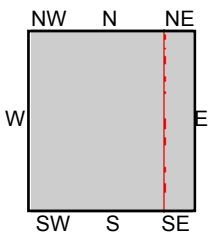
TP, New Britain, 1966, 7.5-minute  
E, Hartford South, 1964, 7.5-minute

**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham





This report includes information from the following map sheet(s).



TP, New Britain, 1953, 7.5-minute  
E, Hartford South, 1952, 7.5-minute

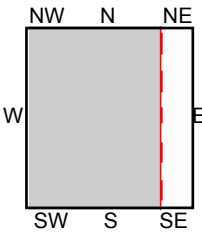
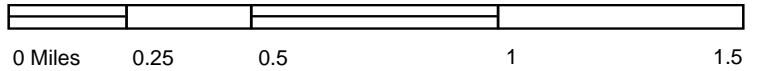
**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
 New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham





UNMAPPED  
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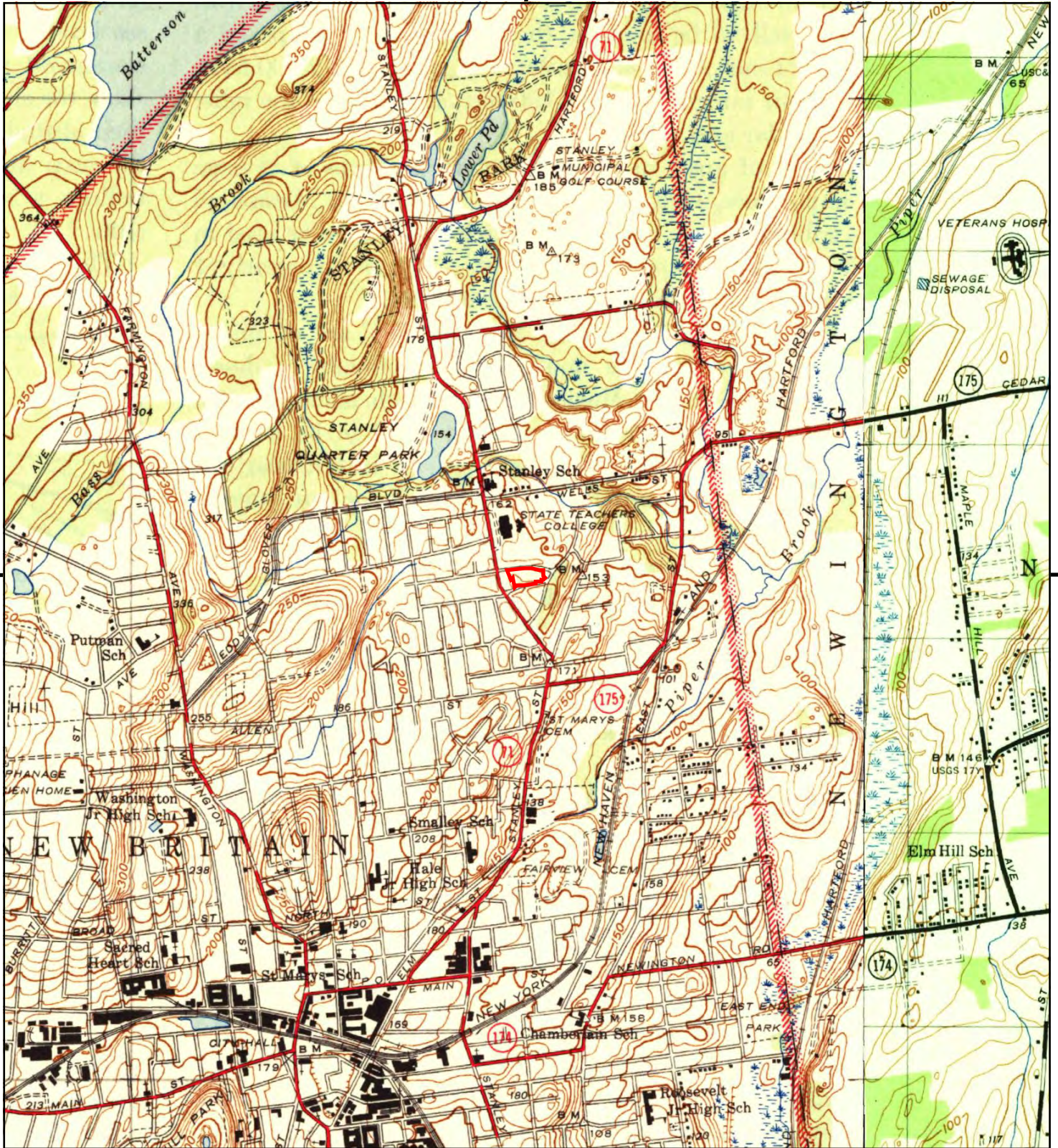
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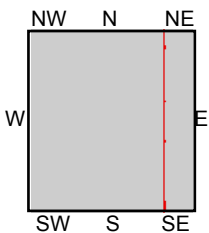
TP, NEW BRITAIN, 1946, 7.5-minute

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manafort Drive  
 New Britain, CT 06053  
 CLIENT: Leggette, Brashears & Graham





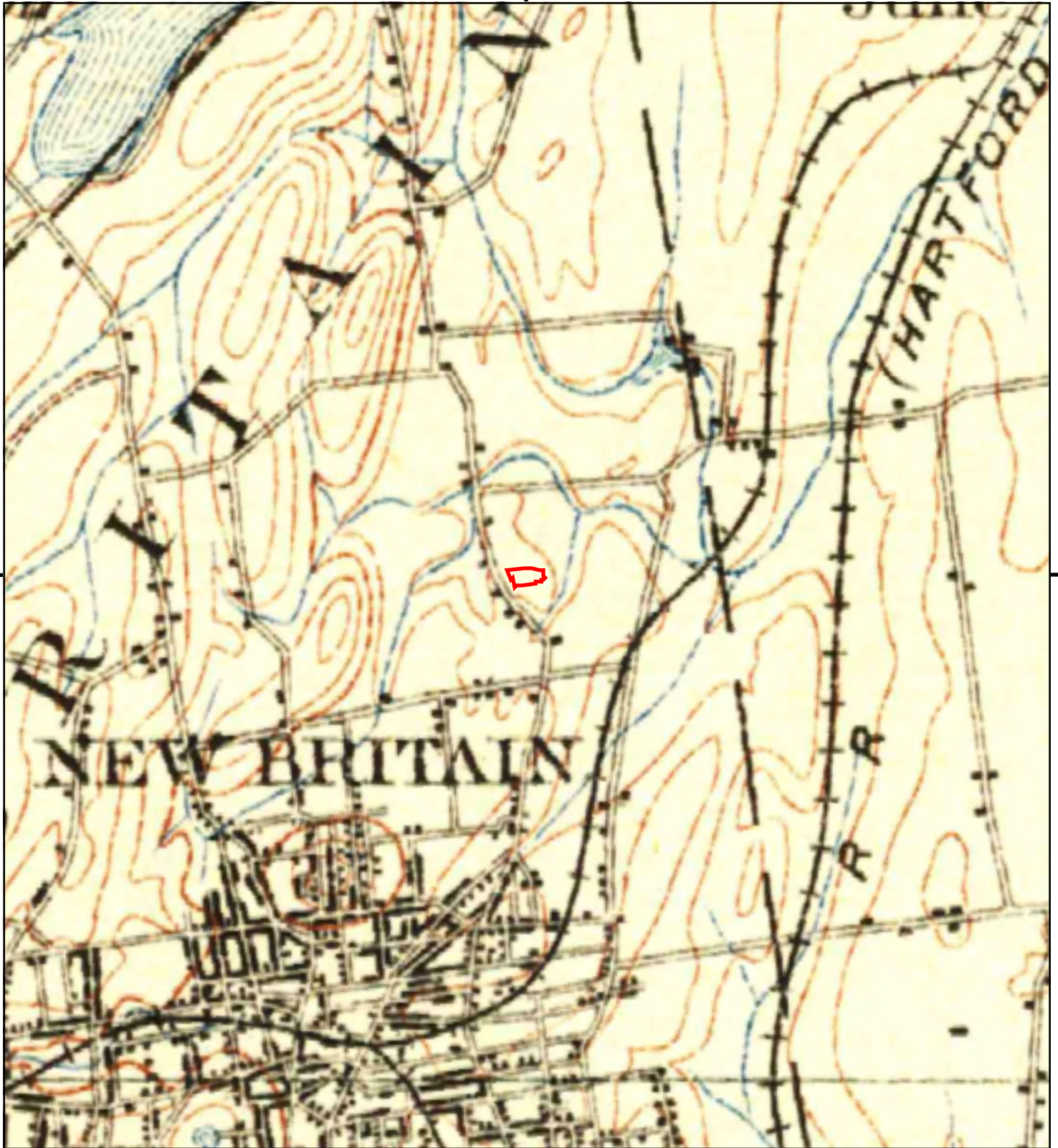
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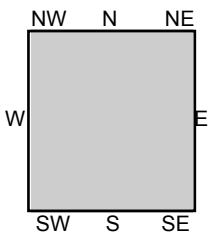
TP, New Britain, 1946, 7.5-minute  
E, Hartford South, 1944, 7.5-minute

SITE NAME: Proposed Parking Garage  
ADDRESS: 55 Paul Manafort Drive  
New Britain, CT 06053  
CLIENT: Leggette, Brashears & Graham





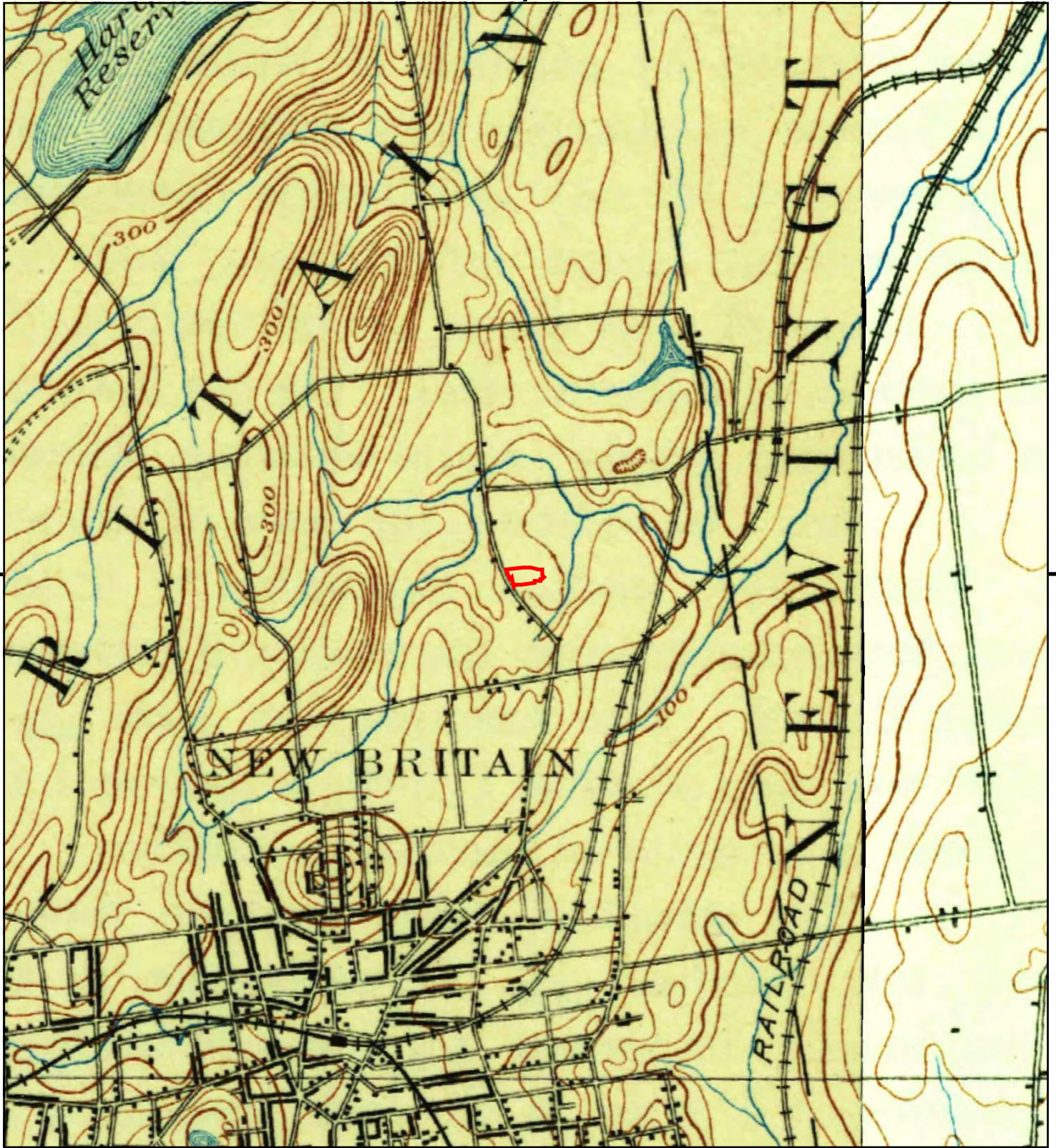
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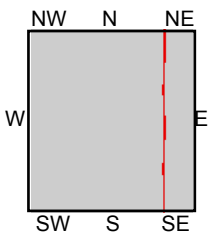
TP, Farmington, 1906, 30-minute

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manafort Drive  
 New Britain, CT 06053  
 CLIENT: Leggette, Brashears & Graham





This report includes information from the following map sheet(s).

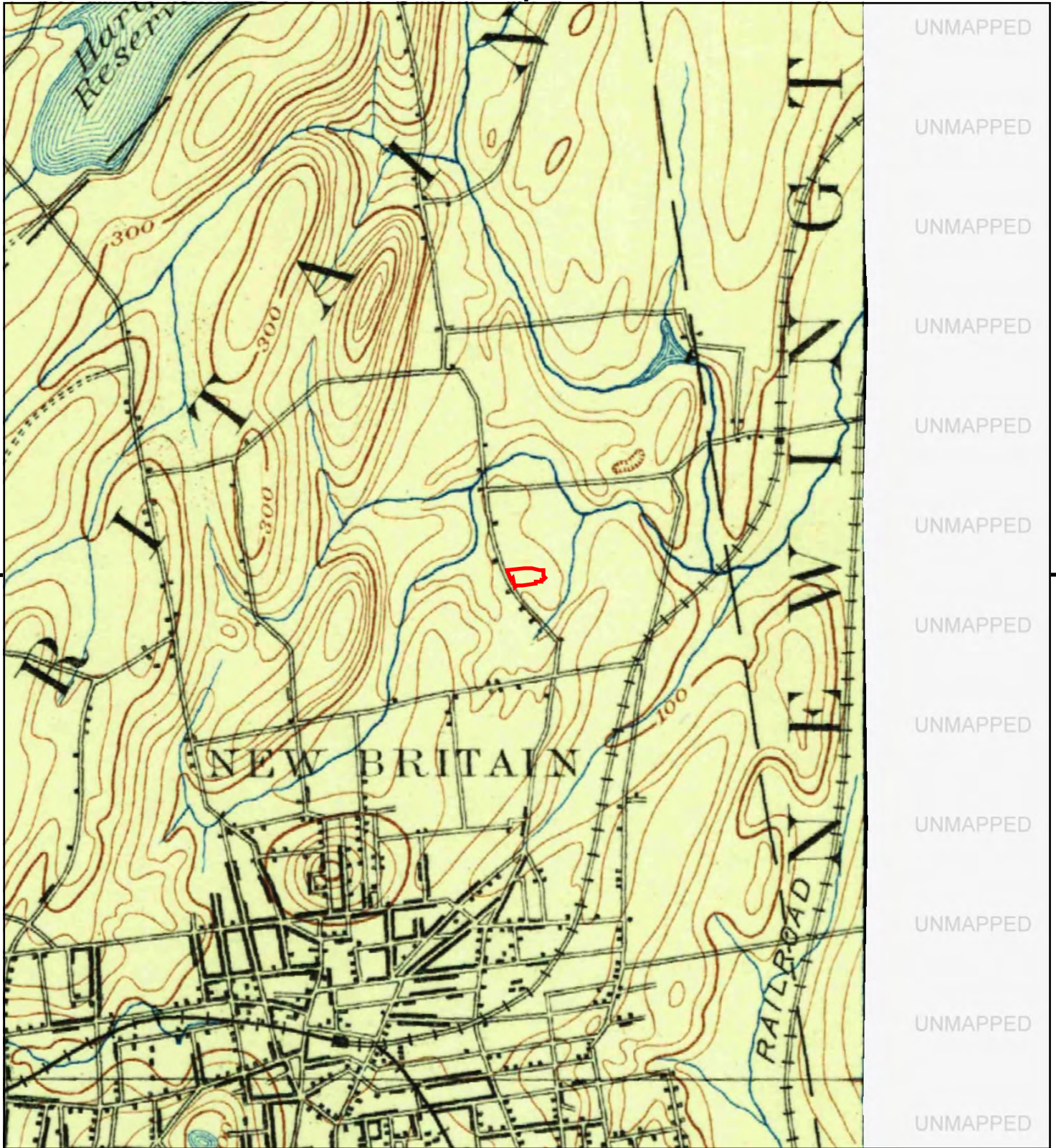


TP, Meriden, 1893, 15-minute  
SE, Middletown, 1893, 15-minute

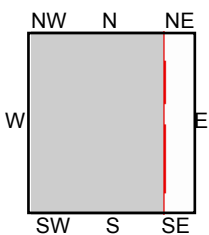
**SITE NAME:** Proposed Parking Garage  
**ADDRESS:** 55 Paul Manafort Drive  
New Britain, CT 06053  
**CLIENT:** Leggette, Brashears & Graham







This report includes information from the following map sheet(s).



TP, Meriden, 1892, 15-minute

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manafort Drive  
 New Britain, CT 06053  
 CLIENT: Leggette, Brashears & Graham



**APPENDIX V**

**SANBORN FIRE INSURANCE MAPS**



Proposed Parking Garage

55 Paul Manafort Drive

New Britain, CT 06053

Inquiry Number: 5027979.3

August 21, 2017

## Certified Sanborn® Map Report



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Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

# Certified Sanborn® Map Report

08/21/17

**Site Name:**

Proposed Parking Garage  
55 Paul Manafort Drive  
New Britain, CT 06053  
EDR Inquiry # 5027979.3

**Client Name:**

Leggette, Brashears & Graham  
4 Research Drive, Suite 204  
Shelton, CT 06484  
Contact: Michael Susca



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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

**Certified Sanborn Results:**

**Certification #** DDCF-4FE4-B151  
**PO #** DASCCS  
**Project** DASCCS

**Maps Provided:**

1978  
1965  
1963  
1961  
1959  
1954  
1950



Sanborn® Library search results

Certification #: DDCF-4FE4-B151

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- Library of Congress
- University Publications of America
- EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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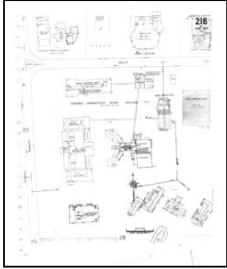
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## Sanborn Sheet Key

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



### 1978 Source Sheets



Volume 2, Sheet 216  
1978



Volume 2, Sheet 218  
1978

### 1965 Source Sheets

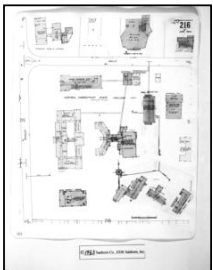


Volume 2, Sheet 216  
1965



Volume 2, Sheet 218  
1965

### 1963 Source Sheets

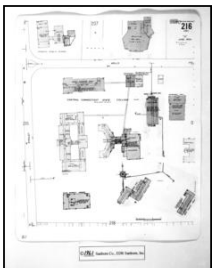


Volume 2, Sheet 216  
1963



Volume 2, Sheet 218  
1963

### 1961 Source Sheets



Volume 2, Sheet 216  
1961



Volume 2, Sheet 218  
1961

## Sanborn Sheet Key

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### 1959 Source Sheets

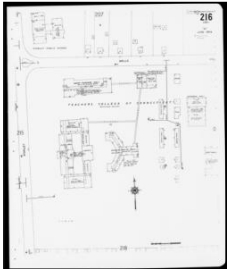


Volume 2, Sheet 216  
1959



Volume 2, Sheet 218  
1959

### 1954 Source Sheets



Volume 2, Sheet 216  
1954



Volume 2, Sheet 218  
1954

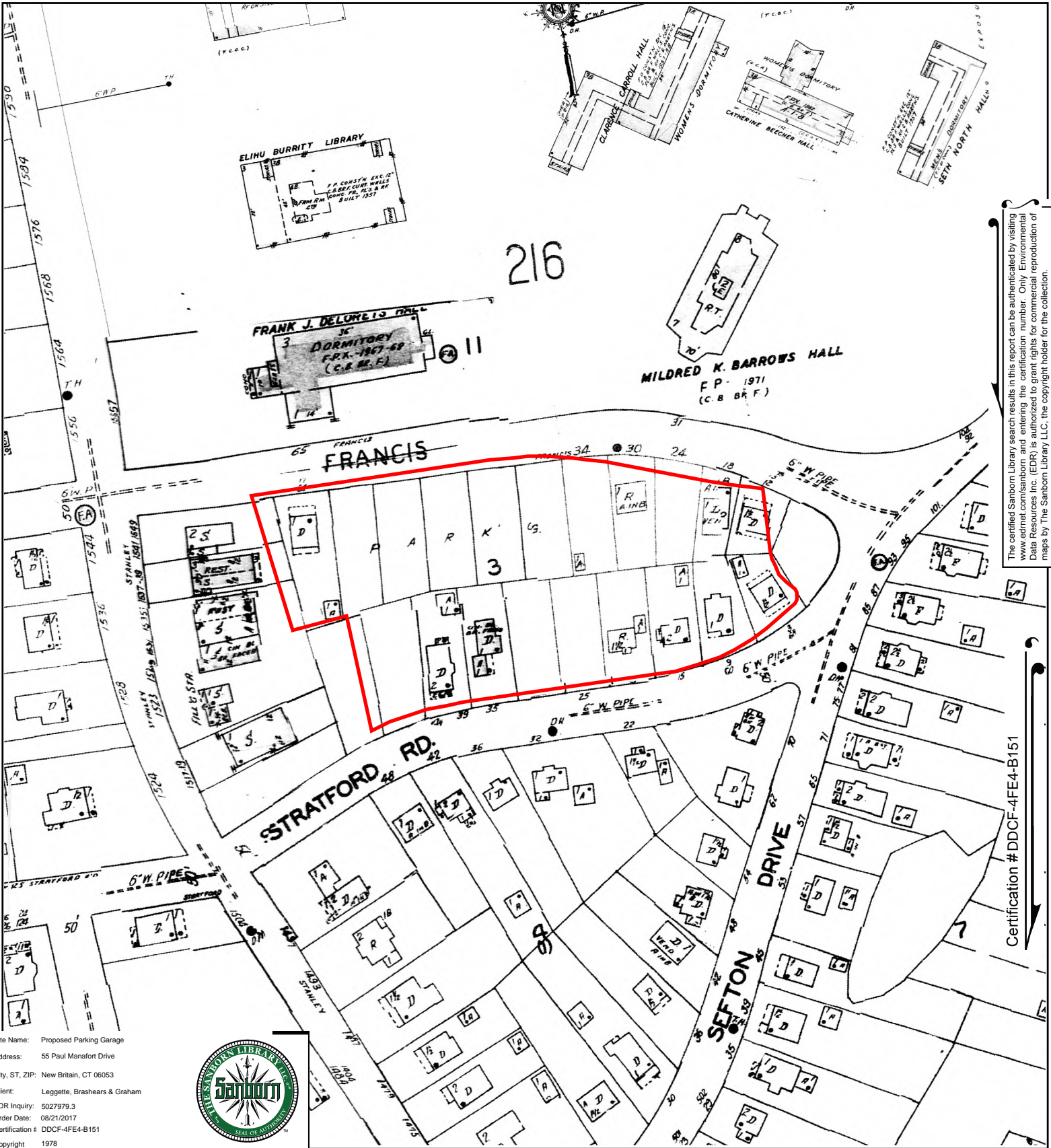
### 1950 Source Sheets



Volume 1, Sheet 55  
1950



Volume 1, Sheet 58  
1950



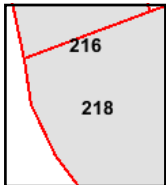
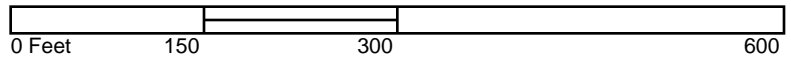
Site Name: Proposed Parking Garage  
 Address: 55 Paul Manafort Drive  
 City, ST, ZIP: New Britain, CT 06053  
 Client: Leggette, Brashears & Graham  
 EDR Inquiry: 5027979.3  
 Order Date: 08/21/2017  
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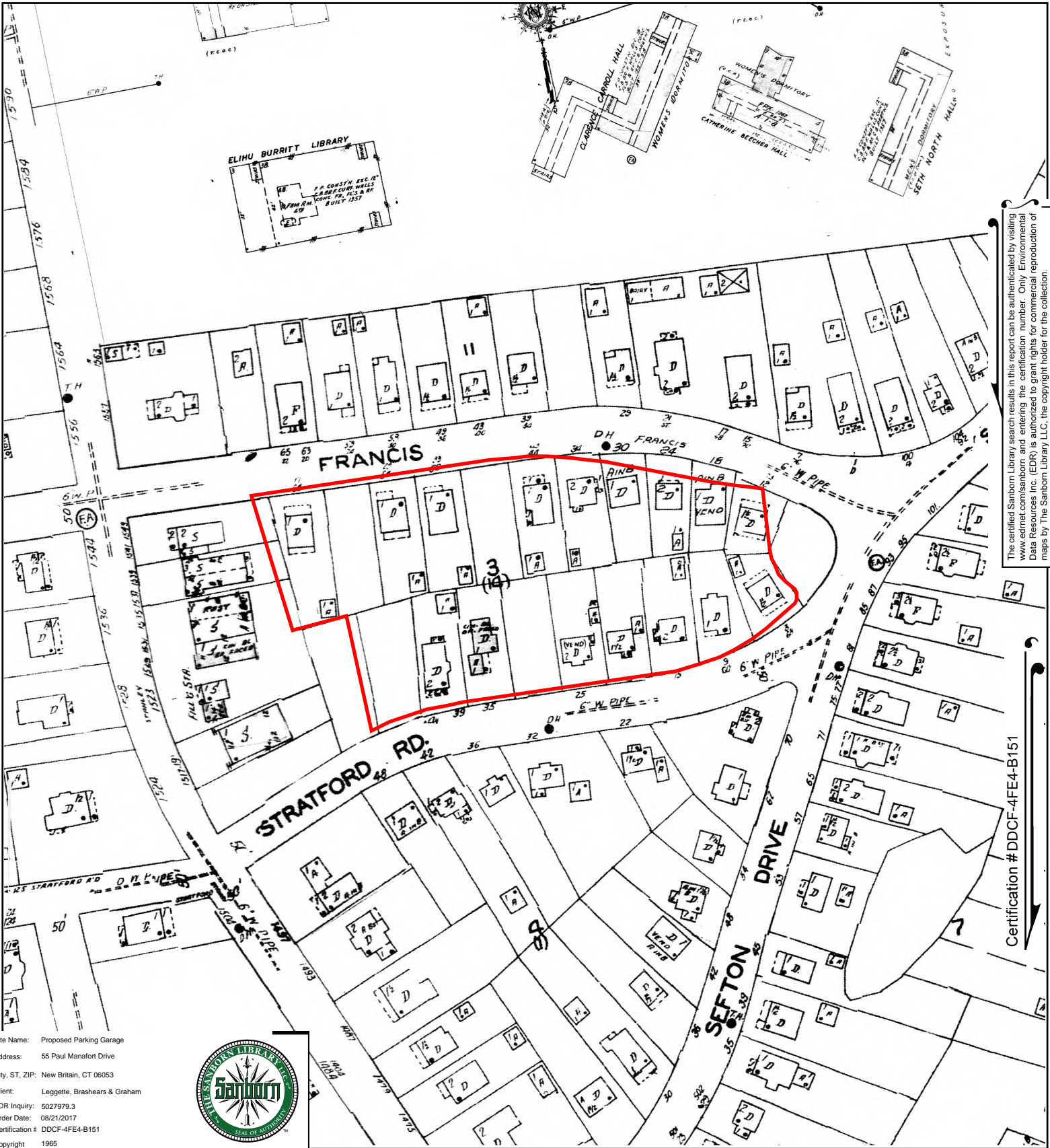
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Volume 2, Sheet 218  
 Volume 2, Sheet 216





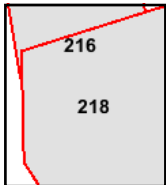
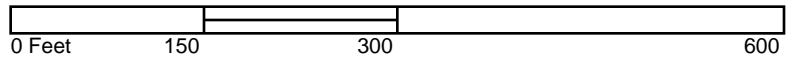
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Certification # DDCF-4FE4-B151

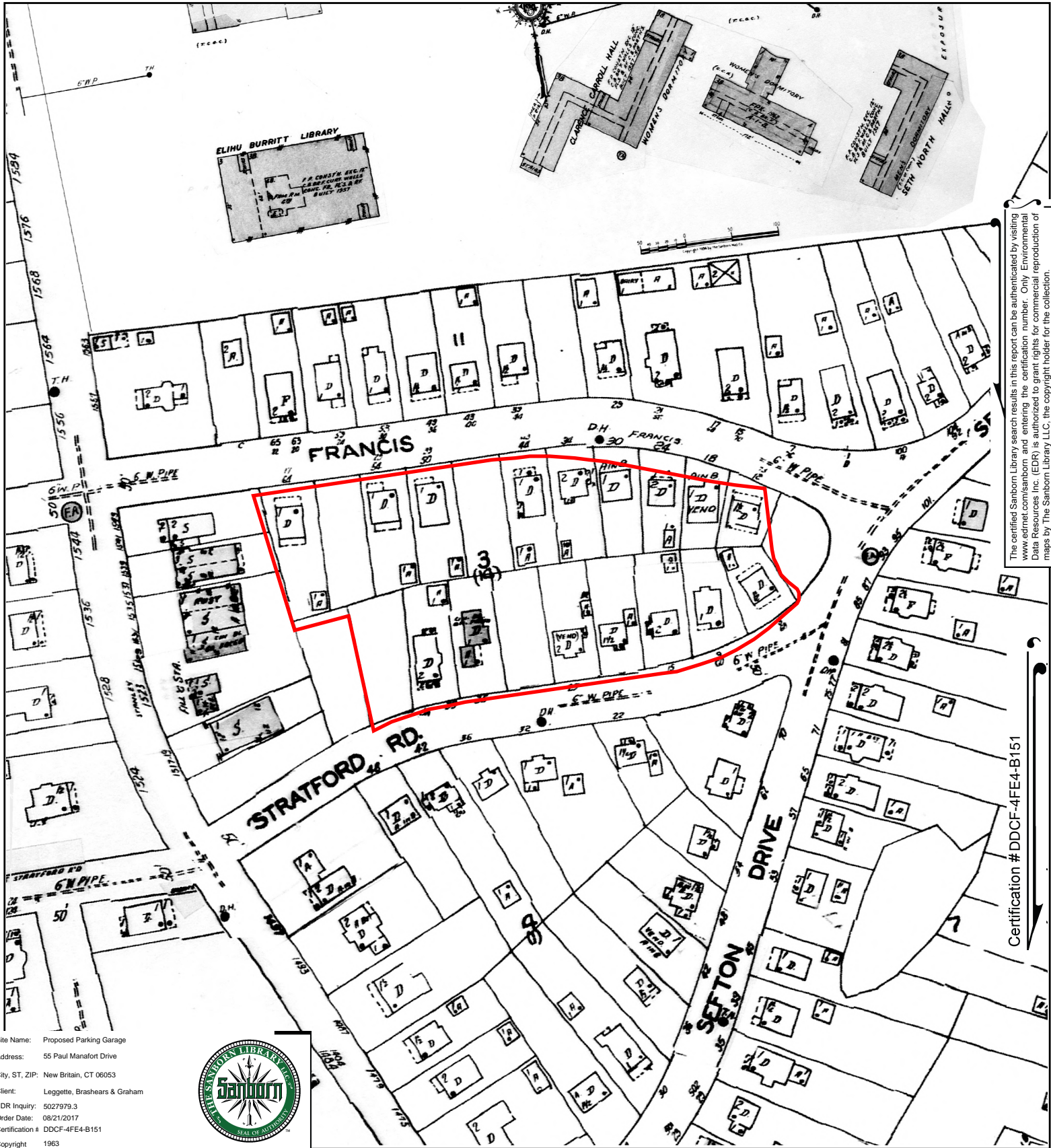
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Address: 55 Paul Manafort Drive

City, ST, ZIP: New Britain, CT 06053

Client: Leggette, Brashears & Graham

EDR Inquiry: 5027979.3

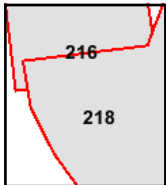
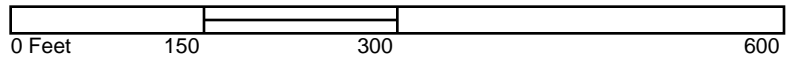
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Certification # DDCF-4FE4-B151

Copyright 1963

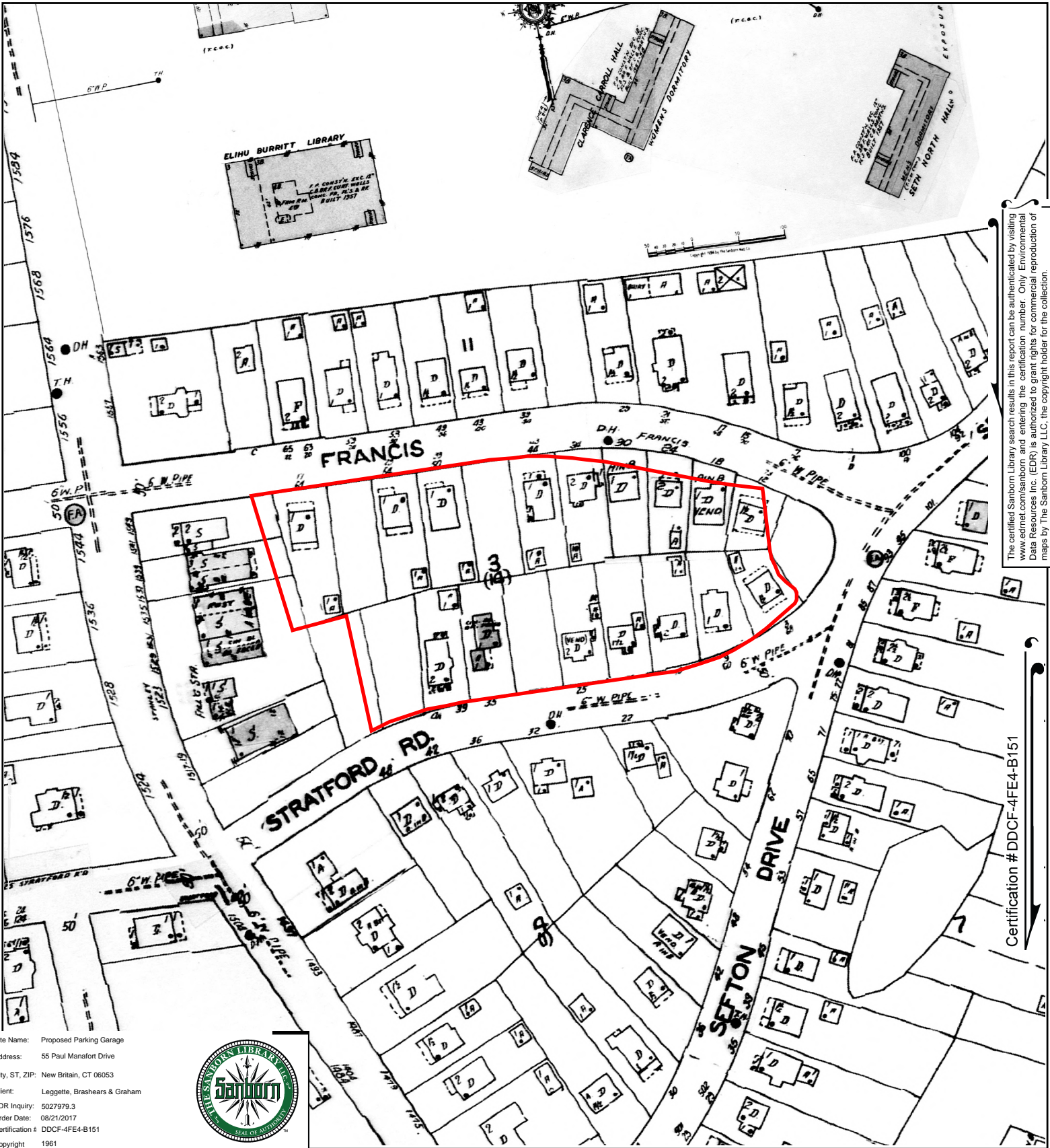


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Volume 2, Sheet 216





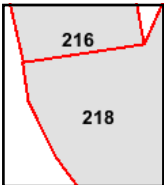
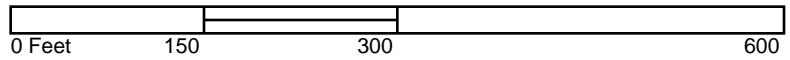
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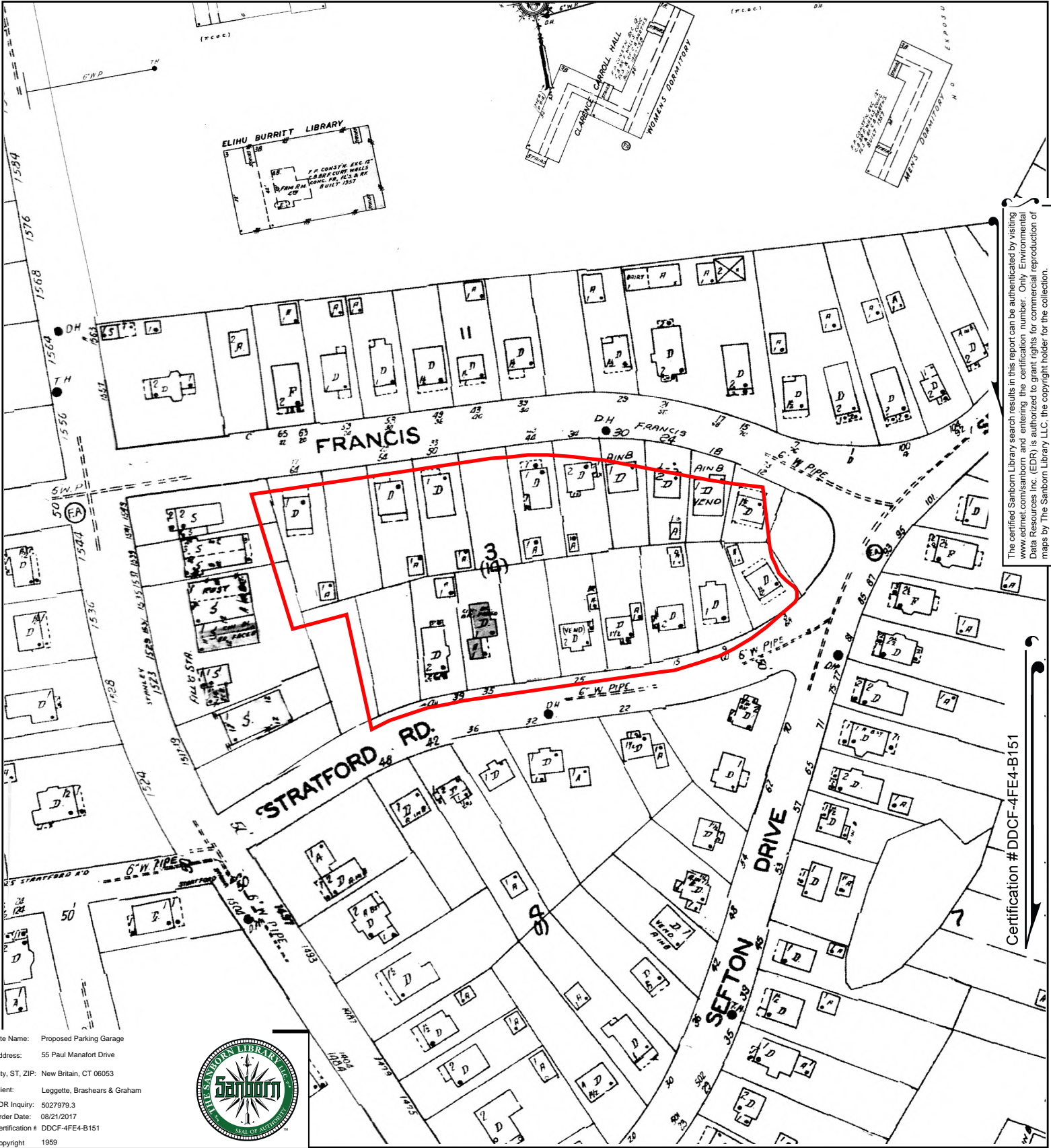


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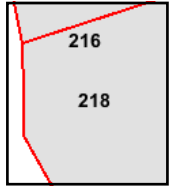
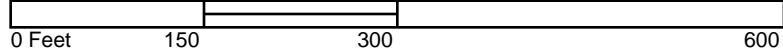
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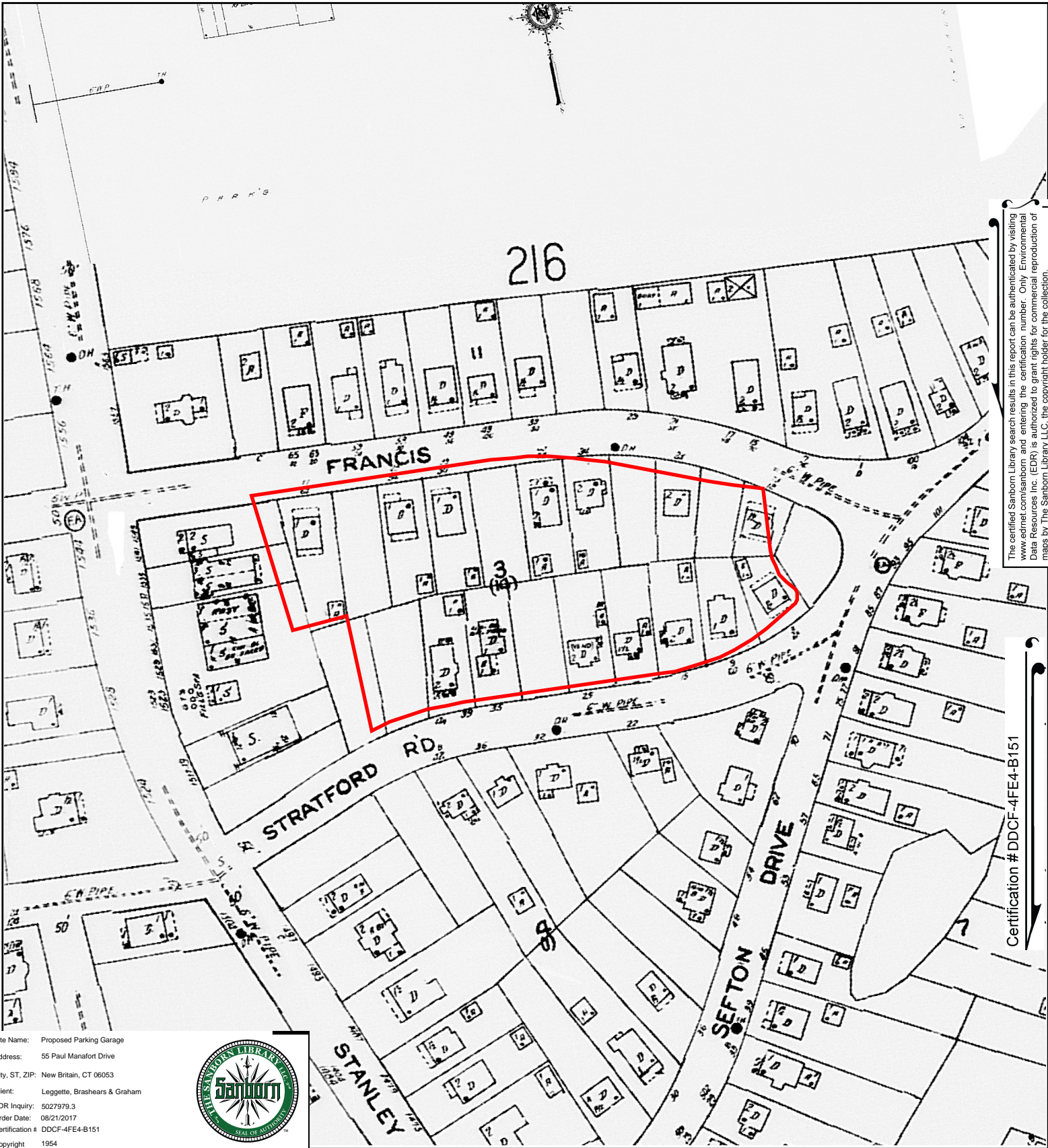


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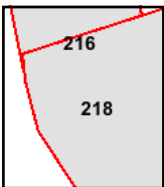
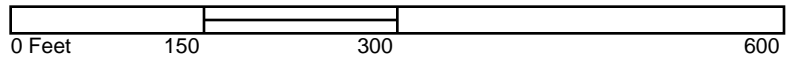
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 Certification # DDCF-4FE4-B151  
 Copyright 1954

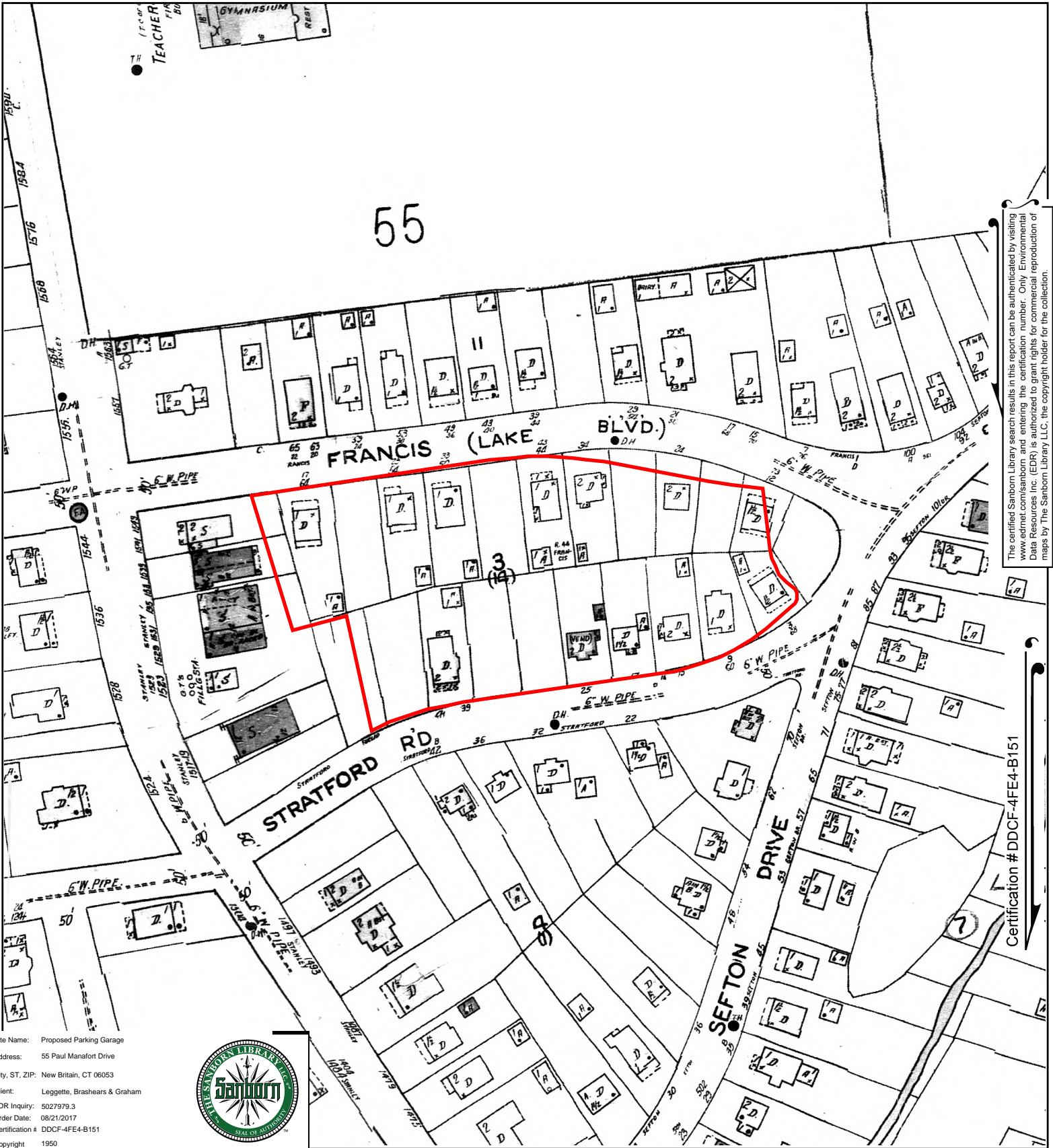


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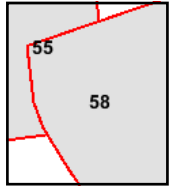
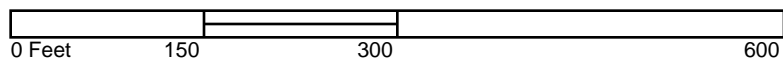
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Volume 1, Sheet 58  
 Volume 1, Sheet 55



**APPENDIX VI**

**ENVIRONMENTAL DATABASE REPORT**  
**(contained on CD)**

**Proposed Parking Garage**

55 Paul Manafort Drive  
New Britain, CT 06053

Inquiry Number: 5027979.2s  
August 21, 2017

# The EDR Radius Map™ Report with GeoCheck®



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

# TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
Executive Summary .....	ES1
Overview Map .....	2
Detail Map .....	3
Map Findings Summary .....	4
Map Findings .....	8
Orphan Summary .....	114
Government Records Searched/Data Currency Tracking .....	GR-1
 <b><u>GEOCHECK ADDENDUM</u></b>	
Physical Setting Source Addendum .....	A-1
Physical Setting Source Summary .....	A-2
Physical Setting SSURGO Soil Map .....	A-5
Physical Setting Source Map .....	A-12
Physical Setting Source Map Findings .....	A-14
Physical Setting Source Records Searched .....	PSGR-1

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

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## EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

### TARGET PROPERTY INFORMATION

#### ADDRESS

55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CT 06053

#### COORDINATES

Latitude (North): 41.6882000 - 41° 41' 17.52"  
Longitude (West): 72.7686980 - 72° 46' 7.31"  
Universal Transverse Mercator: Zone 18  
UTM X (Meters): 685701.1  
UTM Y (Meters): 4617351.0  
Elevation: 162 ft. above sea level

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 5642441 NEW BRITAIN, CT  
Version Date: 2012  
  
East Map: 5644952 HARTFORD SOUTH, CT  
Version Date: 2012

### AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20140721  
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CT 06053

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	JESS GIBSON	93-95 SEFTON DR	CT MANIFEST	Lower	150, 0.028, ENE
A2	ART BARBER EXCAVATIN	1537 STANLEY ST	CT MANIFEST	Higher	151, 0.029, West
A3	CAROLYN MALON SEPHEN	1537 STANLEY SDT	CT MANIFEST	Higher	151, 0.029, West
A4	KLOPP RICHARD W	1529 STANLEY ST	EDR Hist Auto	Higher	160, 0.030, WSW
A5	ABRAHAM COLODNEY TRU	1523 STANLEY ST	CT MANIFEST	Higher	169, 0.032, WSW
A6	CENTRAL CT STATE UNI	1516 STANLEY ST	CT MANIFEST	Higher	242, 0.046, WSW
B7	ROSEMARY WOOLRICH	29 AUDUBON ST	CT LUST, CT SPILLS, CT CPCS	Lower	712, 0.135, East
C8	TONY LEONE	17 FOXON PL	NY MANIFEST	Lower	749, 0.142, ESE
C9	FRANCESCA CIRIELLO	17 FOXON PLACE RD	CT MANIFEST	Lower	749, 0.142, ESE
B10	KAWECKI RESIDENCE	35 AUDUBON STREET	CT LUST	Lower	750, 0.142, East
11	LAMACHIA WILLIAM	6 WELLINGTON ST	CT MANIFEST	Higher	1030, 0.195, SSW
12	NEW HAVEN HOUSING AU	87 FOXON RD	CT MANIFEST	Lower	1276, 0.242, ESE
13	MICHAEL WANIK	44 STEWART STREET	CT LUST, CT SPILLS, CT CPCS	Higher	1468, 0.278, SW
D14	COLLEGE GETTY	1707 STANLEY ST.	CT CPCS	Lower	1669, 0.316, NNW
D15	GVO (FORMER COLLEGE	1707 STANLEY STREET	CT LUST, CT SPILLS	Lower	1669, 0.316, NNW
16	BALDUCCI PROPERTY	2 DIXON STREET	CT LUST, CT SPILLS	Higher	2105, 0.399, SW
E17	PAPA'S DODGE	710 ALLEN ST.	CT LUST, CT CPCS	Lower	2127, 0.403, SE
F18	1615 STANLEY STREET	1615 STANLEY ST	CT LUST, CT ENF, CT MANIFEST, CT NPDES	Higher	2147, 0.407, NNE
F19	C.C.S.U.	1615 STANLEY ST POWE	CT CPCS	Higher	2147, 0.407, NNE
F20	CENTRAL CONN STATE C	1615 STANLEY STREET	CT CPCS	Higher	2147, 0.407, NNE
21	WINSLOW AUTOMATIC	23 SAINT CLAIR AVENU	CT LUST, CT CPCS	Lower	2288, 0.433, ESE
E22	JH METAL FINISHING,	1146 EAST ST	CT LUST, CT SPILLS, CT AIRS, CT ENF, CT NPDES	Lower	2322, 0.440, SE
E23	PAPAS DODGE	ALLEN ST.	CT CPCS	Lower	2324, 0.440, SE
24	GRAYTON SCREW MACHIN	1411 EAST STREET	CT SDADB, CT PROPERTY, CT SPILLS	Lower	2328, 0.441, ENE
25	FOOD BAG #505	325 ALLEN STREET-335	CT LUST, CT SPILLS, CT ENF	Higher	2639, 0.500, SW
26	NATIONAL WELDING AND	690 CEDAR STREET	SEMS-ARCHIVE, CT SHWS, CT SDADB, CT BROWNFIELDS,..	Lower	3952, 0.748, ENE

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

NPL..... National Priority List  
Proposed NPL..... Proposed National Priority List Sites  
NPL LIENS..... Federal Superfund Liens

### ***Federal Delisted NPL site list***

Delisted NPL..... National Priority List Deletions

### ***Federal CERCLIS list***

FEDERAL FACILITY..... Federal Facility Site Information listing  
SEMS..... Superfund Enterprise Management System

### ***Federal RCRA CORRACTS facilities list***

CORRACTS..... Corrective Action Report

### ***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

### ***Federal RCRA generators list***

RCRA-LQG..... RCRA - Large Quantity Generators  
RCRA-SQG..... RCRA - Small Quantity Generators  
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

### ***Federal institutional controls / engineering controls registries***

LUCIS..... Land Use Control Information System  
US ENG CONTROLS..... Engineering Controls Sites List  
US INST CONTROL..... Sites with Institutional Controls

### ***Federal ERNS list***

ERNS..... Emergency Response Notification System

## EXECUTIVE SUMMARY

### ***State and tribal landfill and/or solid waste disposal site lists***

CT SWF/LF..... List of Landfills/Transfer Stations

### ***State and tribal leaking storage tank lists***

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

### ***State and tribal registered storage tank lists***

FEMA UST..... Underground Storage Tank Listing  
CT UST..... Underground Storage Tank Data  
CT AST..... Marine Terminals and Tank Information  
INDIAN UST..... Underground Storage Tanks on Indian Land

### ***State and tribal institutional control / engineering control registries***

CT ENG CONTROLS..... Engineering Controls Listing  
CT AUL..... ELUR Sites

### ***State and tribal voluntary cleanup sites***

CT VCP..... Voluntary Remediation Sites  
INDIAN VCP..... Voluntary Cleanup Priority Listing

### **ADDITIONAL ENVIRONMENTAL RECORDS**

#### ***Local Brownfield lists***

US BROWNFIELDS..... A Listing of Brownfields Sites

#### ***Local Lists of Landfill / Solid Waste Disposal Sites***

CT SWRCY..... Recycling Facilities  
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands  
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations  
ODI..... Open Dump Inventory  
IHS OPEN DUMPS..... Open Dumps on Indian Land

#### ***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL..... Delisted National Clandestine Laboratory Register  
CT CDL..... Clandestine Drug Lab Listing  
US CDL..... National Clandestine Laboratory Register

#### ***Local Land Records***

CT LIENS..... Environmental Liens Listing  
LIENS 2..... CERCLA Lien Information

#### ***Records of Emergency Release Reports***

HMIRS..... Hazardous Materials Information Reporting System

## EXECUTIVE SUMMARY

CT SPILLS 90..... SPILLS 90 data from FirstSearch

### ***Other Ascertainable Records***

FUDS..... Formerly Used Defense Sites  
DOD..... Department of Defense Sites  
SCRD DRYCLEANERS..... State Coalition for Remediation of Drycleaners Listing  
US FIN ASSUR..... Financial Assurance Information  
EPA WATCH LIST..... EPA WATCH LIST  
2020 COR ACTION..... 2020 Corrective Action Program List  
TSCA..... Toxic Substances Control Act  
TRIS..... Toxic Chemical Release Inventory System  
SSTS..... Section 7 Tracking Systems  
ROD..... Records Of Decision  
RMP..... Risk Management Plans  
RAATS..... RCRA Administrative Action Tracking System  
PRP..... Potentially Responsible Parties  
PADS..... PCB Activity Database System  
ICIS..... Integrated Compliance Information System  
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)  
MLTS..... Material Licensing Tracking System  
COAL ASH DOE..... Steam-Electric Plant Operation Data  
COAL ASH EPA..... Coal Combustion Residues Surface Impoundments List  
PCB TRANSFORMER..... PCB Transformer Registration Database  
RADINFO..... Radiation Information Database  
HIST FTTS..... FIFRA/TSCA Tracking System Administrative Case Listing  
DOT OPS..... Incident and Accident Data  
CONSENT..... Superfund (CERCLA) Consent Decrees  
INDIAN RESERV..... Indian Reservations  
FUSRAP..... Formerly Utilized Sites Remedial Action Program  
UMTRA..... Uranium Mill Tailings Sites  
LEAD SMELTERS..... Lead Smelter Sites  
US AIRS..... Aerometric Information Retrieval System Facility Subsystem  
US MINES..... Mines Master Index File  
ABANDONED MINES..... Abandoned Mines  
FINDS..... Facility Index System/Facility Registry System  
ECHO..... Enforcement & Compliance History Information  
UXO..... Unexploded Ordnance Sites  
DOCKET HWC..... Hazardous Waste Compliance Docket Listing  
FUELS PROGRAM..... EPA Fuels Program Registered Listing  
CT DRYCLEANERS..... Drycleaner Facilities  
CT Financial Assurance..... Financial Assurance Information Listing  
CT LEAD..... Lead Inspection Database  
CT LWDS..... Connecticut Leachate and Wastewater Discharge Sites  
CT SEH..... List of Significant Environmental Hazards Report to DEEP

### **EDR HIGH RISK HISTORICAL RECORDS**

#### ***EDR Exclusive Records***

EDR MGP..... EDR Proprietary Manufactured Gas Plants  
EDR Hist Cleaner..... EDR Exclusive Historic Dry Cleaners

### **EDR RECOVERED GOVERNMENT ARCHIVES**

#### ***Exclusive Recovered Govt. Archives***

CT RGA HWS..... Recovered Government Archive State Hazardous Waste Facilities List

## EXECUTIVE SUMMARY

CT RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank

### SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

### STANDARD ENVIRONMENTAL RECORDS

#### ***State- and tribal - equivalent CERCLIS***

CT SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Environmental Protection's Inventory of Hazardous Disposal Sites.

A review of the CT SHWS list, as provided by EDR, and dated 04/23/2010 has revealed that there is 1 CT SHWS site within approximately 1 mile of the target property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b><i>NATIONAL WELDING AND</i></b> State ID: 269 EPA ID: CTD001155167	<b><i>690 CEDAR STREET</i></b>	<b><i>ENE 1/2 - 1 (0.748 mi.)</i></b>	<b><i>26</i></b>	<b><i>108</i></b>

CT SDADB: Site Discovery and Assessment Database.

A review of the CT SDADB list, as provided by EDR, and dated 04/23/2010 has revealed that there is 1 CT SDADB site within approximately 0.5 miles of the target property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b><i>GRAYTON SCREW MACHIN</i></b> Facility Id: 3497	<b><i>1411 EAST STREET</i></b>	<b><i>ENE 1/4 - 1/2 (0.441 mi.)</i></b>	<b><i>24</i></b>	<b><i>98</i></b>

#### ***State and tribal leaking storage tank lists***

CT LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Protection's Leaking Underground Storage Tank List.

A review of the CT LUST list, as provided by EDR, and dated 01/25/2017 has revealed that there are 10

## EXECUTIVE SUMMARY

CT LUST sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b>MICHAEL WANIK</b> Lust Status: 4 LUST Id: 34460	<b>44 STEWART STREET</b>	<b>SW 1/4 - 1/2 (0.278 mi.)</b>	<b>13</b>	<b>25</b>
<b>BALDUCCI PROPERTY</b> Lust Status: 3 LUST Id: 49492	<b>2 DIXON STREET</b>	<b>SW 1/4 - 1/2 (0.399 mi.)</b>	<b>16</b>	<b>34</b>
<b>1615 STANLEY STREET</b> Lust Status: 4 LUST Id: 59436	<b>1615 STANLEY ST</b>	<b>NNE 1/4 - 1/2 (0.407 mi.)</b>	<b>F18</b>	<b>40</b>
<b>FOOD BAG #505</b> Lust Status: 3 LUST Id: 60968	<b>325 ALLEN STREET-335</b>	<b>SW 1/4 - 1/2 (0.500 mi.)</b>	<b>25</b>	<b>102</b>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b>ROSEMARY WOOLRICH</b> Lust Status: 4 LUST Id: 32586	<b>29 AUDUBON ST</b>	<b>E 1/8 - 1/4 (0.135 mi.)</b>	<b>B7</b>	<b>14</b>
<b>KAWECKI RESIDENCE</b> Lust Status: 1 LUST Id: 49032	<b>35 AUDUBON STREET</b>	<b>E 1/8 - 1/4 (0.142 mi.)</b>	<b>B10</b>	<b>20</b>
<b>GVO (FORMER COLLEGE)</b> Lust Status: 3 LUST Id: 28494	<b>1707 STANLEY STREET</b>	<b>NNW 1/4 - 1/2 (0.316 mi.)</b>	<b>D15</b>	<b>29</b>
<b>PAPA'S DODGE</b> Lust Status: 4 LUST Id: 35746	<b>710 ALLEN ST.</b>	<b>SE 1/4 - 1/2 (0.403 mi.)</b>	<b>E17</b>	<b>37</b>
<b>WINSLOW AUTOMATIC</b> Lust Status: 3 LUST Id: 31217	<b>23 SAINT CLAIR AVENU</b>	<b>ESE 1/4 - 1/2 (0.433 mi.)</b>	<b>21</b>	<b>87</b>
<b>JH METAL FINISHING,</b> Lust Status: 2 LUST Id: 61005	<b>1146 EAST ST</b>	<b>SE 1/4 - 1/2 (0.440 mi.)</b>	<b>E22</b>	<b>90</b>

### ADDITIONAL ENVIRONMENTAL RECORDS

#### **Other Ascertainable Records**

CT CPCS: A list of Contaminated or Potentially Contaminated Sites within Connecticut. This list represents the "Hazardous Waste Facilities," as defined in Section 22a-134f of the Connecticut General Statutes (CGS). The list contains the following types of sites: Sites listed on the Inventory of Hazardous Waste Disposal Sites; Sites subject to the Property Transfer Act; Sites at which underground storage tanks are known to have leaked; Sites at which hazardous waste subject to the RCRA; Sites that are included in EPA's (CERCLIS); Sites that are the subject of an order issued by the Commissioner of DEP that requires investigation and remediation of a potential or known source of pollution; and Sites that have entered into one of the Department's Voluntary Remediation Programs.

A review of the CT CPCS list, as provided by EDR, and dated 03/15/2017 has revealed that there are 8

## EXECUTIVE SUMMARY

CT CPCS sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b>MICHAEL WANIK</b> Lust Status: LUST Completed (DEP's significant hazard definition)	<b>44 STEWART STREET</b>	<b>SW 1/4 - 1/2 (0.278 mi.)</b>	<b>13</b>	<b>25</b>
C.C.S.U. Lust Status: Investigation	1615 STANLEY ST POWE	NNE 1/4 - 1/2 (0.407 mi.)	F19	86
CENTRAL CONN STATE C Lust Status: Cleanup Initiated	1615 STANLEY STREET	NNE 1/4 - 1/2 (0.407 mi.)	F20	87
<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<b>ROSEMARY WOOLRICH</b> Lust Status: LUST Completed (DEP's significant hazard definition)	<b>29 AUDUBON ST</b>	<b>E 1/8 - 1/4 (0.135 mi.)</b>	<b>B7</b>	<b>14</b>
COLLEGE GETTY Lust Status: Cleanup Initiated	1707 STANLEY ST.	NNW 1/4 - 1/2 (0.316 mi.)	D14	29
<b>PAPA'S DODGE</b> Lust Status: Cleanup Initiated	<b>710 ALLEN ST.</b>	<b>SE 1/4 - 1/2 (0.403 mi.)</b>	<b>E17</b>	<b>37</b>
<b>WINSLOW AUTOMATIC</b> Lust Status: Cleanup Initiated	<b>23 SAINT CLAIR AVENU</b>	<b>ESE 1/4 - 1/2 (0.433 mi.)</b>	<b>21</b>	<b>87</b>
PAPAS DODGE Lust Status: LUST Completed (DEP's significant hazard definition)	ALLEN ST.	SE 1/4 - 1/2 (0.440 mi.)	E23	97

CT MANIFEST: Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

A review of the CT MANIFEST list, as provided by EDR, and dated 07/30/2013 has revealed that there are 8 CT MANIFEST sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
ART BARBER EXCAVATIN EPA Id: CTP000002053	1537 STANLEY ST	W 0 - 1/8 (0.029 mi.)	A2	9
CAROLYN MALON SEPHEN EPA Id: CT\$000030690	1537 STANLEY SDT	W 0 - 1/8 (0.029 mi.)	A3	10
ABRAHAM COLODNEY TRU EPA Id: CT\$000020808	1523 STANLEY ST	WSW 0 - 1/8 (0.032 mi.)	A5	11
CENTRAL CT STATE UNI EPA Id: CTP000021877	1516 STANLEY ST	WSW 0 - 1/8 (0.046 mi.)	A6	12
LAMACHIA WILLIAM EPA Id: CTP000023032	6 WELLINGTON ST	SSW 1/8 - 1/4 (0.195 mi.)	11	23
<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
JESS GIBSON EPA Id: CTP000021458	93-95 SEFTON DR	ENE 0 - 1/8 (0.028 mi.)	1	8
FRANCESCA CIRIELLO EPA Id: CTP000026743	17 FOXON PLACE RD	ESE 1/8 - 1/4 (0.142 mi.)	C9	19
NEW HAVEN HOUSING AU	87 FOXON RD	ESE 1/8 - 1/4 (0.242 mi.)	12	24



## EXECUTIVE SUMMARY

EPA Id: CTP000017098

NY MANIFEST: Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

A review of the NY MANIFEST list, as provided by EDR, and dated 01/30/2017 has revealed that there is 1 NY MANIFEST site within approximately 0.25 miles of the target property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
TONY LEONE EPA ID: CTP000026743	17 FOXON PL	ESE 1/8 - 1/4 (0.142 mi.)	C8	17

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there is 1 EDR Hist Auto site within approximately 0.125 miles of the target property.

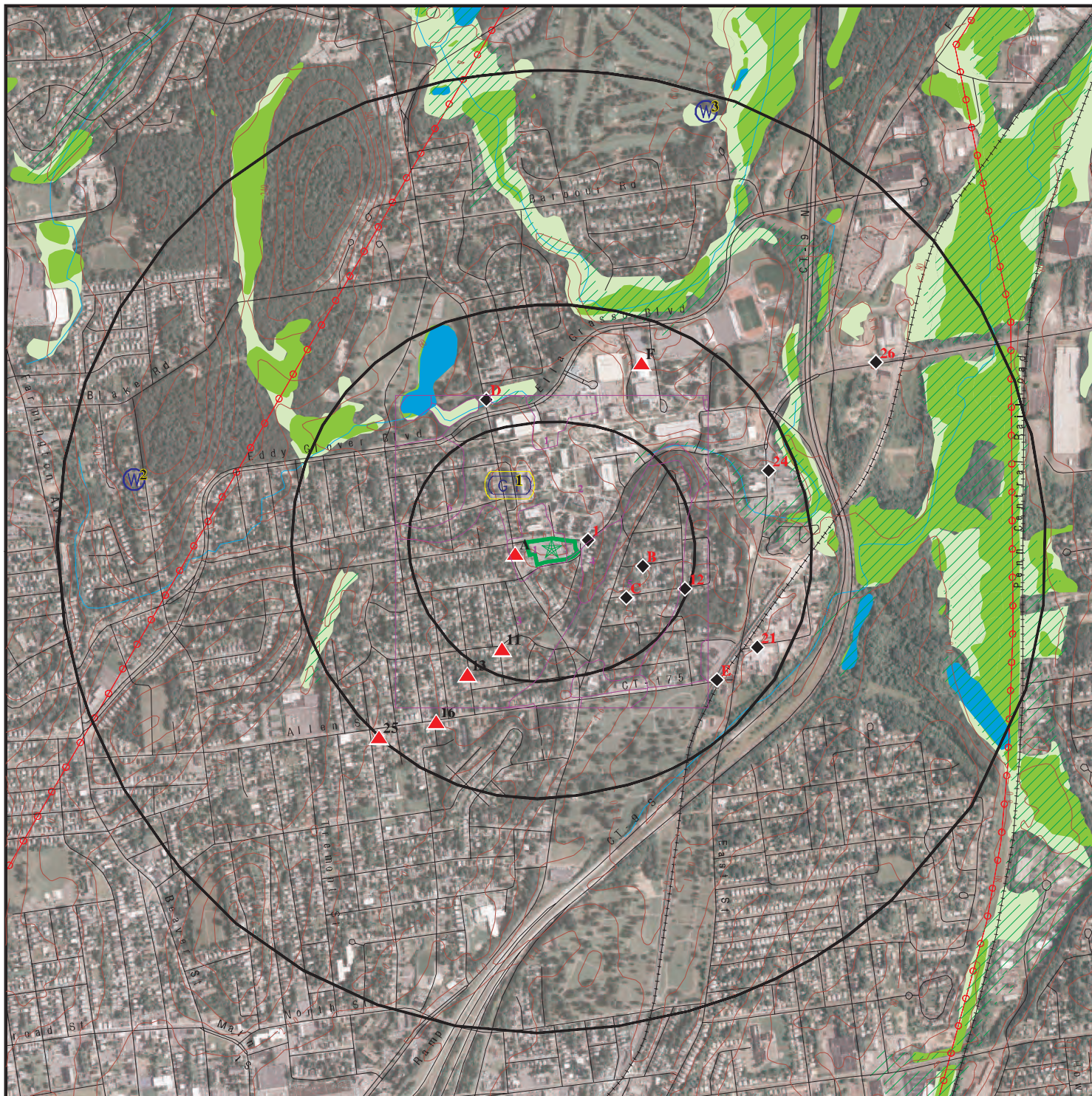
<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
KLOPP RICHARD W	1529 STANLEY ST	WSW 0 - 1/8 (0.030 mi.)	A4	11

## EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 2 records.

<u>Site Name</u>	<u>Database(s)</u>
FORMER GASOLINE STATION	CT LUST
KEENEY POND PUMP STATION	CT SDADB

# OVERVIEW MAP - 5027979.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

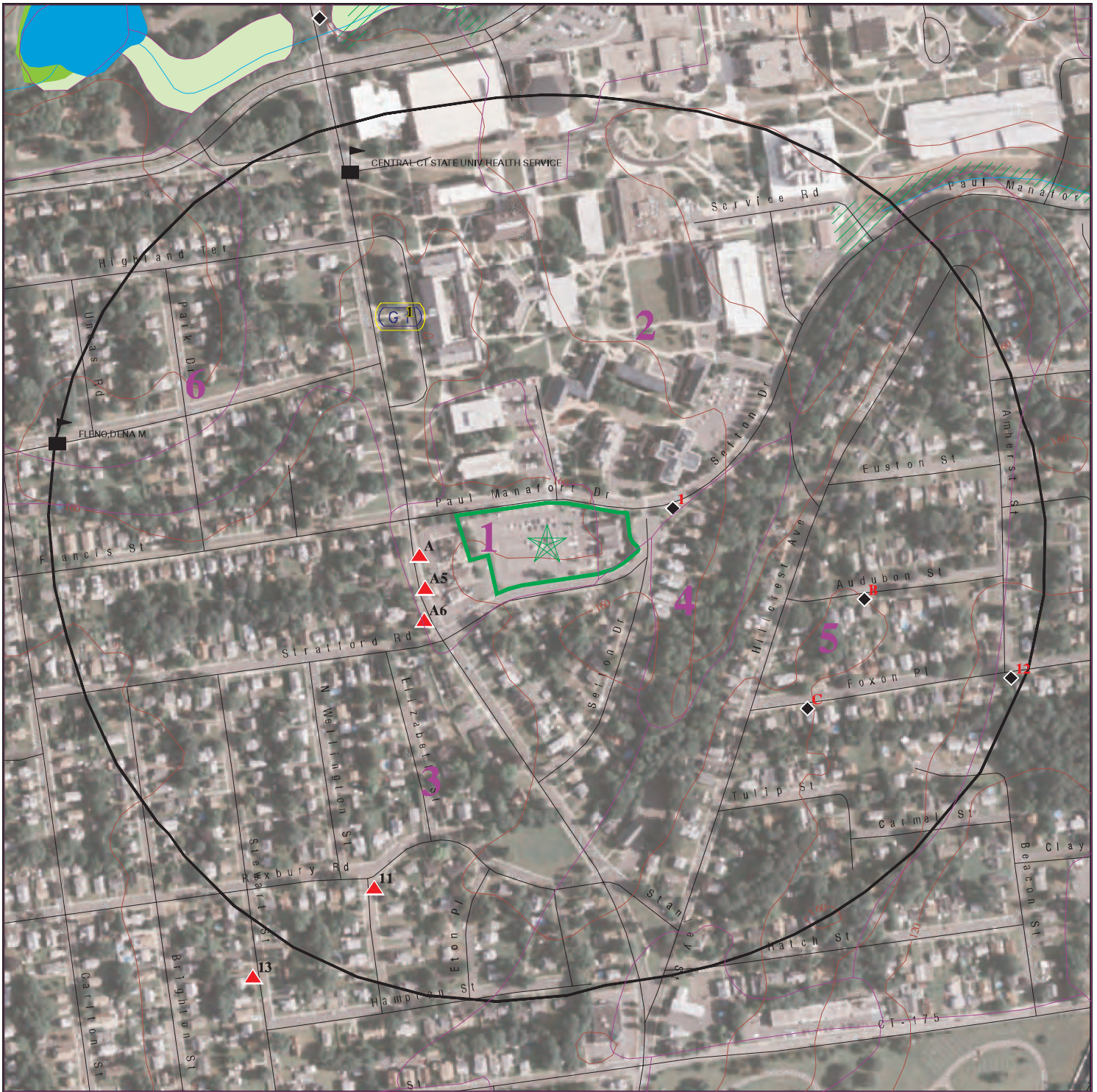
Upgradient Area








This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manaford Drive  
 New Britain CT 06053  
 LAT/LONG: 41.6882 / 72.768698

CLIENT: Leggette, Brashears & Graham  
 CONTACT: Michael Susca  
 INQUIRY #: 5027979.2S  
 DATE: August 21, 2017 4:32 pm

# DETAIL MAP - 5027979.2S



-  Target Property
-  Sites at elevations higher than or equal to the target property
-  Sites at elevations lower than the target property
-  Manufactured Gas Plants
-  Sensitive Receptors
-  National Priority List Sites
-  Dept. Defense Sites

-  Indian Reservations BIA
-  100-year flood zone
-  500-year flood zone
-  National Wetland Inventory
-  State Wetlands



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manafort Drive  
 New Britain CT 06053  
 LAT/LONG: 41.6882 / 72.768698

CLIENT: Leggette, Brashears & Graham  
 CONTACT: Michael Susca  
 INQUIRY #: 5027979.2s  
 DATE: August 21, 2017 4:33 pm

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<b>STANDARD ENVIRONMENTAL RECORDS</b>								
<b><i>Federal NPL site list</i></b>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
<b><i>Federal Delisted NPL site list</i></b>								
Delisted NPL	1.000		0	0	0	0	NR	0
<b><i>Federal CERCLIS list</i></b>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
<b><i>Federal CERCLIS NFRAP site list</i></b>								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA CORRACTS facilities list</i></b>								
CORRACTS	1.000		0	0	0	0	NR	0
<b><i>Federal RCRA non-CORRACTS TSD facilities list</i></b>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA generators list</i></b>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<b><i>Federal institutional controls / engineering controls registries</i></b>								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
<b><i>Federal ERNS list</i></b>								
ERNS	TP		NR	NR	NR	NR	NR	0
<b><i>State- and tribal - equivalent CERCLIS</i></b>								
CT SHWS	1.000		0	0	0	1	NR	1
CT SDADB	0.500		0	0	1	NR	NR	1
<b><i>State and tribal landfill and/or solid waste disposal site lists</i></b>								
CT SWF/LF	0.500		0	0	0	NR	NR	0
<b><i>State and tribal leaking storage tank lists</i></b>								
CT LUST	0.500		0	2	8	NR	NR	10
INDIAN LUST	0.500		0	0	0	NR	NR	0
<b><i>State and tribal registered storage tank lists</i></b>								
FEMA UST	0.250		0	0	NR	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CT UST	0.250		0	0	NR	NR	NR	0
CT AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
<b>State and tribal institutional control / engineering control registries</b>								
CT ENG CONTROLS	0.500		0	0	0	NR	NR	0
CT AUL	0.500		0	0	0	NR	NR	0
<b>State and tribal voluntary cleanup sites</b>								
CT VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
<b>State and tribal Brownfields sites</b>								
CT BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b>ADDITIONAL ENVIRONMENTAL RECORDS</b>								
<b>Local Brownfield lists</b>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b>Local Lists of Landfill / Solid Waste Disposal Sites</b>								
CT SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
<b>Local Lists of Hazardous waste / Contaminated Sites</b>								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
CT CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
<b>Local Land Records</b>								
CT PROPERTY	TP		NR	NR	NR	NR	NR	0
CT LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
<b>Records of Emergency Release Reports</b>								
HMIRS	TP		NR	NR	NR	NR	NR	0
CT SPILLS	TP		NR	NR	NR	NR	NR	0
CT SPILLS 90	TP		NR	NR	NR	NR	NR	0
<b>Other Ascertainable Records</b>								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CT AIRS	TP		NR	NR	NR	NR	NR	0
CT CPCS	0.500		0	1	7	NR	NR	8
CT DRYCLEANERS	0.250		0	0	NR	NR	NR	0
CT ENF	TP		NR	NR	NR	NR	NR	0
CT Financial Assurance	TP		NR	NR	NR	NR	NR	0
CT LEAD	TP		NR	NR	NR	NR	NR	0
CT LWDS	0.250		0	0	NR	NR	NR	0
CT MANIFEST	0.250		5	3	NR	NR	NR	8
NY MANIFEST	0.250		0	1	NR	NR	NR	1
CT NPDES	TP		NR	NR	NR	NR	NR	0
CT SEH	0.500		0	0	0	NR	NR	0

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		1	NR	NR	NR	NR	1

## MAP FINDINGS SUMMARY

<u>Database</u>	<u>Search Distance (Miles)</u>	<u>Target Property</u>	<u>&lt; 1/8</u>	<u>1/8 - 1/4</u>	<u>1/4 - 1/2</u>	<u>1/2 - 1</u>	<u>&gt; 1</u>	<u>Total Plotted</u>
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
<b><u>EDR RECOVERED GOVERNMENT ARCHIVES</u></b>								
<b><i>Exclusive Recovered Govt. Archives</i></b>								
CT RGA HWS	TP		NR	NR	NR	NR	NR	0
CT RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	6	7	16	1	0	30

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1  
ENE  
< 1/8  
0.028 mi.  
150 ft.

**JESS GIBSON**  
**93-95 SEFTON DR**  
**NEW BRITAIN, CT 06053**

**CT MANIFEST**    **S113478144**  
**N/A**

**Relative:**  
**Lower**

CT MANIFEST:

**Actual:**  
**151 ft.**

Detail:

Year: 1998  
Manifest Id: MAK047746  
EPA ID: CTP000021458  
TSDf EPA ID: MAD019371079  
TSDf Name: GENERAL CHEMICAL CORP  
TSDf Address: 133 LELAND ST  
TSDf City,St,Zip: FRAMINGHAM, MA 01701  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 06/23/1998  
Transporter EPA ID: MAD019371079  
Transporter Name: GENERAL CHEMICAL CORP  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: Not reported  
Generator Mailing Addr: 93-95 SEFTON DR  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: No  
Date Shipped: 06/23/1998  
Date Received: 07/01/1998  
Last modified date: 04/26/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 1998  
Manifest Id: MAK047746  
Waste Occurrence: 1  
UNNA: 3077  
Hazard Class: 9  
US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
No of Containers: 001  
Container Type: CF  
Quantity: 900  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-26 00:00:00  
DEO Who Last Modified Record: IG

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JESS GIBSON (Continued)**

**S113478144**

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-26 00:00:00

**A2**  
**West**  
**< 1/8**  
**0.029 mi.**  
**151 ft.**

**ART BARBER EXCAVATING INC**  
**1537 STANLEY ST**  
**NEW BRITAIN, CT**

**CT MANIFEST** **S109735034**  
**N/A**

**Site 1 of 5 in cluster A**

**Relative:**  
**Higher**

CT MANIFEST:

**Actual:**  
**166 ft.**

Detail:

Year: 1988  
Manifest Id: CTC0134341  
EPA ID: CTP000002053  
TSDf EPA ID: CTD021816889  
TSDf Name: UNITED INDUSTRIAL SERVICES INC  
TSDf Address: 136 GRACEY AVE  
TSDf City,St,Zip: MERIDEN, CT 06450  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 02/26/1988  
Transporter EPA ID: CTD000636498  
Transporter Name: TRI-S INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2038753892  
Generator Mailing Addr: 1537 STANLEY ST  
Generator Mailing City/State/Zip: Not reported  
Generator Mailing Country: USA  
Special Handling: Yes  
Discrepancies: No  
Date Shipped: 02/26/1988  
Date Received: 02/29/1988  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 1988  
Manifest Id: CTC0134341  
Waste Occurrence: 1  
UNNA: 1993  
Hazard Class: FLAMMABLE  
US Dot Description: WASTE FLAMMABLE LIQUID NOS  
No of Containers: 001  
Container Type: TT

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ART BARBER EXCAVATING INC (Continued)**

**S109735034**

Quantity: 490  
Weight/Volume: G  
Additional Description: Y  
Handling Code: S02  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

**A3**  
**West**  
**< 1/8**  
**0.029 mi.**  
**151 ft.**

**CAROLYN MALON SEPHEN MORAN**  
**1537 STANLEY SDT**  
**NEW BRITAIN, CT 06053**

**CT MANIFEST** **S109721464**  
**N/A**

**Site 2 of 5 in cluster A**

**Relative:**  
**Higher**

CT MANIFEST:

Detail:

**Actual:**  
**166 ft.**

Year: 1990  
Manifest Id: CTF0034651  
EPA ID: CT\$000030690  
TSDf EPA ID: MAD981206774  
TSDf Name: JOSEPH FREEDMAN CO INC  
TSDf Address: 40 ALBANY ST  
TSDf City,St,Zip: SPRINGFIELD, MA 01105  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 11/09/1990  
Transporter EPA ID: MAD985276369  
Transporter Name: MED WASTE MGT INC (TRANSPORTER)  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2032258894  
Generator Mailing Addr: 1537 STANLEY SDT  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: No  
Discrepancies: No  
Date Shipped: 11/09/1990  
Date Received: 11/09/1990  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 1990  
Manifest Id: CTF0034651

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**CAROLYN MALON SEPHEN MORAN (Continued)**

**S109721464**

Waste Occurrence: 1  
UNNA: 9189  
Hazard Class: ORM-E  
US Dot Description: HAZARDOUS WASTE LIQUID, NOS  
No of Containers: 001  
Container Type: CF  
Quantity: 2  
Weight/Volume: G  
Additional Description: Y  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D011  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

**A4**  
**WSW**  
**< 1/8**  
**0.030 mi.**  
**160 ft.**

**KLOPP RICHARD W**  
**1529 STANLEY ST**  
**NEW BRITAIN, CT 06053**  
**Site 3 of 5 in cluster A**

**EDR Hist Auto** **1020421308**  
**N/A**

**Relative:**  
**Higher**

EDR Hist Auto

**Actual:**  
**165 ft.**

Year:	Name:	Type:
1969	KLOPP RICHARD W	Gasoline Service Stations
1970	KLOPP RICHARD W	Gasoline Service Stations
1971	KLOPP RICHARD W	Gasoline Service Stations
1972	KLOPP RICHARD W	Gasoline Service Stations
1973	KLOPP RICHARD W	Gasoline Service Stations
1974	KLOPP RICHARD W	Gasoline Service Stations
1975	KLOPP RICHARD W	Gasoline Service Stations
1976	KLOPP RICHARD W	Gasoline Service Stations

**A5**  
**WSW**  
**< 1/8**  
**0.032 mi.**  
**169 ft.**

**ABRAHAM COLODNEY TRUSTEE**  
**1523 STANLEY ST**  
**NEW BRITAIN, CT**  
**Site 4 of 5 in cluster A**

**CT MANIFEST** **S109720835**  
**N/A**

**Relative:**  
**Higher**

CT MANIFEST:

Detail:

**Actual:**  
**165 ft.**

Year: 1987  
Manifest Id: CTB0098354  
EPA ID: CT\$000020808  
TSDf EPA ID: CTD021816889  
TSDf Name: UNITED WASTE OIL CO INC  
TSDf Address: 136 GRACEY AVE  
TSDf City,St,Zip: MERIDEN, CT 06450  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 09/21/1987  
Transporter EPA ID: CTD021816889  
Transporter Name: UNITED WASTE OIL COMPANY INC  
Transporter Address: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ABRAHAM COLODNEY TRUSTEE (Continued)**

**S109720835**

Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 0000000000  
Generator Mailing Addr: 1523 STANLEY ST  
Generator Mailing City/State/Zip: Not reported  
Generator Mailing Country: USA  
Special Handling: No  
Discrepancies: No  
Date Shipped: 09/21/1987  
Date Received: 09/21/1987  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

**Waste:**

Year: 1987  
Manifest Id: CTB0098354  
Waste Occurrence: 1  
UNNA: 1993  
Hazard Class: FLAMMABLE  
US Dot Description: WASTE FLAMMABLE LIQUID, NOS  
No of Containers: 001  
Container Type: TT  
Quantity: 200  
Weight/Volume: G  
Additional Description: Y  
Handling Code: T50  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

**A6**  
**WSW**  
**< 1/8**  
**0.046 mi.**  
**242 ft.**

**CENTRAL CT STATE UNIVERSITY**  
**1516 STANLEY ST**  
**NEW BRITAIN, CT 06053**  
**Site 5 of 5 in cluster A**

**CT MANIFEST S109749478**  
**N/A**

**Relative:**  
**Higher**

**CT MANIFEST:**

**Detail:**

**Actual:**  
**165 ft.**

Year: 1998  
Manifest Id: PAE6727372  
EPA ID: CTP000021877  
TSDf EPA ID: PAD085690592  
TSDf Name: REPUBLIC ENVIRONMENTAL SYS  
TSDf Address: 2869 SANDSTONE DR  
TSDf City,St,Zip: HATFIELD, PA 19440

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**CENTRAL CT STATE UNIVERSITY (Continued)**

**S109749478**

TSDF Country: USA  
TSDF Telephone: Not reported  
Transport Date: 11/24/1998  
Transporter EPA ID: CTD983896341  
Transporter Name: LOGANO TRANSPORTATION CO INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: Not reported  
Generator Mailing Addr: 1516 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Yes  
Date Shipped: 11/24/1998  
Date Received: 11/25/1998  
Last modified date: 04/26/2004  
Last modified by: IG  
Comments: Not reported

**Waste:**

Year: 1998  
Manifest Id: PAE6727372  
Waste Occurrence: 1  
UNNA: 3077  
Hazard Class: 9  
US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
No of Containers: 001  
Container Type: CM  
Quantity: 9720  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-26 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-26 00:00:00

Map ID  
 Direction  
 Distance  
 Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
 EPA ID Number

**B7**  
**East**  
**1/8-1/4**  
**0.135 mi.**  
**712 ft.**

**ROSEMARY WOOLRICH**  
**29 AUDUBON ST**  
**NEW BRITAIN, CT 6051**

**Site 1 of 2 in cluster B**

**CT LUST**    **S103156802**  
**CT SPILLS**    **N/A**  
**CT CPCS**

**Relative:**  
**Lower**

LUST:

**Actual:**  
**161 ft.**

LUST Id:	4461
UST Facility Id:	Not reported
LUST Case Id:	32586
Lust Status:	Lust Completed
Processing Status:	Not reported
EPA Reportable:	0
Motor Fuel:	No
Diesel:	No
Gasoline:	No
Other:	No
Other Release:	Not reported
No Release:	No
Leak:	No
Tank:	No
Piping:	No
Overfill:	No
Removal:	No
Incident Date:	11/14/1996
Entry Date:	Not reported
Site Case Id:	9605983
UST Site Id:	Not reported
Cost Recovery Spill Case #:	Not reported
Old SITS Number:	Not reported
Case Log Id:	Not reported
Monthly Report Id:	0
UST Owner Id:	Not reported
LUST Owner Id:	Not reported
UST Event Id:	4564
Contact Info:	Not reported
Contact EMail:	Not reported
Site Contact City,St,Zip:	UNKNOWN
2nd Contact:	Not reported
2nd Contact EMail:	Not reported
2nd Contact Address:	Not reported
2nd Contact City,St,Zip:	UNKNOWN
2nd Contact Address 2:	Not reported
2nd Contact City 2:	Not reported
2nd Contact Phone Number:	Not reported
2nd Contact Fax Number:	Not reported
2nd Contact Type:	Not reported
Facility City Num:	89
Site Contact:	Not reported
Site Contact Address:	Not reported
Site Contact Add 2:	Not reported
Site Contact City 2:	Not reported
Site Contact Phone:	Not reported
Site Contact Fax:	Not reported
Site Contact Type:	Not reported
Department Contact 1:	Not reported
Department Contact 2:	Not reported
Referral Source:	Not reported
Offsite Source:	0

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

ROSEMARY WOOLRICH (Continued)

S103156802

Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: Yes  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: Yes  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: Not reported  
Resp Party Address: Not reported  
Resp Party City,St,Zip: Not reported  
Resp Party Town Number: UNKNOWN  
Resp Party Phone: Not reported  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 35  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: Not reported  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: Not reported  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlaid: No  
Fund Judgment: No  
Fund Recovered: No  
Cellar Borings: No  
Install Micro Wells: No  
Ground Water Sample: No  
Soil Sample: No  
Soil Gas: No  
Site Inspect: No  
Soil Excavate: No  
Geo Probe: No  
Survey: No  
Potable Well Sample: No



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ROSEMARY WOOLRICH (Continued)**

**S103156802**

Sample MWS: No  
Ground Water Gauging: No  
Soil Venting: No  
Active: No  
NOV Action: None  
NOV Issued: Not reported  
NOV Due: Not reported  
NOV Received: Not reported  
NOV Closed: Not reported  
NOV Disc Date: Not reported  
NOV Issued Date: Not reported  
NOV Compliance Sched: Not reported  
NOV Admin Order: Not reported  
NOV Referred To Ag: Not reported  
Stop All NOV Actions: No  
Release Invest Rpt: No  
DEP App Letter 1: No  
Correct Action Plan: No  
DEP App Letter 2: No  
Rem Sys Install: No  
Rem Sys Install Date: Not reported  
Closure Date: Not reported  
Rem Sys Monitoring Rpt: No  
Qrtly Gwater Mon Rpts: No  
Closure Req Rpt: No  
DEP Closure Letter: No  
Referred To: Not reported  
No Wells: Not reported  
Lph Wells: Not reported  
User Stamp: Not reported  
Date Stamp: Not reported  
Correspondence: Not reported  
Environmental Impact: Not reported  
FollowUp: Not reported  
GW Comments: Not reported  
Location Desc: Not reported  
NOV Comments: Not reported  
Release Desc: Not reported  
Running Comments: HEATING OIL, , 550 GALLON U.S.T. REMOVED  
Work Performed: Not reported

**SPILLS:**

Year of Database: 1996  
Case Number: 9605983  
Who Took Spill: 923  
Assigned To: 0  
Report Date: 11/14/1996  
Report Time: 15:20:10  
Date Release: 11/14/1996  
Time Responded: Not reported  
Reported By: ROSEMARY WOOLRICH  
Phone: 860 8263000  
Representing: Self  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: Closed

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

ROSEMARY WOOLRICH (Continued)

S103156802

Continuous Spill: False  
Released Substance: HEATING OIL  
Qty: 1 (Gallons)  
Emergency Measure: 550 GALLON U.S.T. REMOVED  
Water Body: NA  
Discharger: SAME  
Telephone: Not reported  
Responsible Party: YES  
RP Address 1: 29 AUDUBON ST  
RP City,St,Zip: NEW BRITAIN, CT 06051  
Historic: False  
Waterbody: False  
Time Stamp: 1996-11-14 15:26:05  
Sr Inspector: McCann, Mike  
At Inspctor: \*\*NO RESPONSE  
User Stamp: Not reported  
Comments: Not reported  
Action: Removed Tank  
Other Action: Not reported  
Agency ID: DEP Dispatch  
Other Agency: Not reported  
DEP Bureau: Not reported  
DEP Agency: Not reported  
Cause ID: Inground Tank Failure  
Other Cause: Not reported  
Media ID: Ground Surface  
Other Media: Not reported  
Release Type: petroleum  
Other Release: Not reported  
Waterbody: Groundwater  
Other Wtrbody: Not reported

CPCS:

Site Type: LUST  
Lust Status code: 4  
Lust Status: Lust Completed (DEP's significant hazard definition)  
PTP Form: Not reported  
Program: Not reported  
Comments: Heating Oil, , 550 Gallon U.s.t. Removed  
Site Type Definition: Leaking Underground Storage Tanks Completed

C8 TONY LEONE  
ESE 17 FOXON PL  
1/8-1/4 NEW BRITAIN, CT 06053  
0.142 mi.  
749 ft. Site 1 of 2 in cluster C

NY MANIFEST 1009220721  
N/A

Relative: NY MANIFEST:  
Lower Country: USA  
EPA ID: CTP000026743  
Actual: Facility Status: Not reported  
161 ft. Location Address 1: 17 FOXON PL  
Code: BP  
Location Address 2: Not reported  
Total Tanks: Not reported  
Location City: NEW BRITAIN  
Location State: CT

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**TONY LEONE (Continued)**

**1009220721**

Location Zip: 06053  
Location Zip 4: Not reported

NY MANIFEST:  
EPAID: CTP000026743  
Mailing Name: TONY LEONE  
Mailing Contact: N/S  
Mailing Address 1: 153 GREENWOOD AVE  
Mailing Address 2: Not reported  
Mailing City: NEW BRITAIN  
Mailing State: CT  
Mailing Zip: 06051  
Mailing Zip 4: Not reported  
Mailing Country: USA  
Mailing Phone: 8607294046

NY MANIFEST:  
Document ID: NYG3284631  
Manifest Status: Not reported  
seq: 01  
Year: 2002  
Trans1 State ID: 17764ACT  
Trans2 State ID: Not reported  
Generator Ship Date: 08/22/2002  
Trans1 Recv Date: 08/22/2002  
Trans2 Recv Date: Not reported  
TSD Site Recv Date: 09/04/2002  
Part A Recv Date: Not reported  
Part B Recv Date: Not reported  
Generator EPA ID: CTP000026743  
Trans1 EPA ID: CTD983896341  
Trans2 EPA ID: Not reported  
TSDF ID 1: NYD049836679  
TSDF ID 2: Not reported  
Manifest Tracking Number: Not reported  
Import Indicator: Not reported  
Export Indicator: Not reported  
Discr Quantity Indicator: Not reported  
Discr Type Indicator: Not reported  
Discr Residue Indicator: Not reported  
Discr Partial Reject Indicator: Not reported  
Discr Full Reject Indicator: Not reported  
Manifest Ref Number: Not reported  
Alt Facility RCRA ID: Not reported  
Alt Facility Sign Date: Not reported  
MGMT Method Type Code: Not reported  
Waste Code: D008 - LEAD 5.0 MG/L TCLP  
Waste Code: Not reported  
Waste Code: Not reported  
Waste Code: Not reported  
Waste Code: Not reported  
Waste Code: Not reported  
Quantity: 00070  
Units: P - Pounds  
Number of Containers: 001  
Container Type: DM - Metal drums, barrels  
Handling Method: L Landfill.

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**TONY LEONE (Continued)**

**1009220721**

Specific Gravity: 01.00

[Click this hyperlink](#) while viewing on your computer to access additional NY\_MANIFEST: detail in the EDR Site Report.

**C9  
ESE  
1/8-1/4  
0.142 mi.  
749 ft.**

**FRANCESCA CIRIELLO  
17 FOXON PLACE RD  
NEW BRITAIN, CT 06053**

**CT MANIFEST S109752884  
N/A**

**Site 2 of 2 in cluster C**

**Relative:  
Lower**

CT MANIFEST:

**Actual:  
161 ft.**

Detail:

Year: 2002  
Manifest Id: NYG3284631  
EPA ID: CTP000026743  
TSDf EPA ID: NYD049836679  
TSDf Name: C W M CHEMICAL SERVICES LLC  
TSDf Address: 1550 BALMER RD  
TSDf City,St,Zip: MODEL CITY, NY 14107  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 08/22/2002  
Transporter EPA ID: CTD983896341  
Transporter Name: WASTE MGT N E ENV TRANSPORT INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: Not reported  
Generator Mailing Addr: 17 FOXON PLACE RD  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Yes  
Date Shipped: 08/22/2002  
Date Received: 09/04/2002  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 2002  
Manifest Id: NYG3284631  
Waste Occurrence: 1  
UNNA: 3077  
Hazard Class: 9  
US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
No of Containers: 001

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FRANCESCA CIRIELLO (Continued)**

**S109752884**

Container Type: DM  
Quantity: 70  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

**B10**  
**East**  
**1/8-1/4**  
**0.142 mi.**  
**750 ft.**

**KAWECKI RESIDENCE**  
**35 AUDUBON STREET**  
**NEW BRITAIN, CT 6053**

**CT LUST S109377312**  
**N/A**

**Site 2 of 2 in cluster B**

**Relative:**  
**Lower**

**LUST:**

**Actual:**  
**160 ft.**

LUST Id: 0  
UST Facility Id: 0  
LUST Case Id: 49032  
Lust Status: Pending  
Processing Status: Not reported  
EPA Reportable: 0  
Motor Fuel: No  
Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: No  
Piping: No  
Overfill: No  
Removal: No  
Incident Date: Not reported  
Entry Date: 09/17/2008  
Site Case Id: 200804611  
UST Site Id: 0  
Cost Recovery Spill Case #: 0  
Old SITS Number: 0  
Case Log Id: 0  
Monthly Report Id: 0  
UST Owner Id: 0  
LUST Owner Id: Not reported  
UST Event Id: 0  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Rosemary Rainville (Tankworks)  
2nd Contact EMail: Not reported  
2nd Contact Address: 360 Cneter Street  
2nd Contact City,St,Zip: 77, CT 6040  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Manchester  
2nd Contact Phone Number: 8006533140  
2nd Contact Fax Number: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**KAWECKI RESIDENCE (Continued)**

**S109377312**

2nd Contact Type: Owner  
Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: Yes  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: Yes  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: George Kaweck  
Resp Party Address: 35 Audubon Street  
Resp Party City,St,Zip: New Britain, CT 6053  
Resp Party Town Number: 89  
Resp Party Phone: Not reported  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 0  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: Not reported  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: 0  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**KAWECKI RESIDENCE (Continued)**

**S109377312**

Fund Outlayed:	No
Fund Judgment:	No
Fund Recovered:	No
Cellar Borings:	No
Install Micro Wells:	No
Ground Water Sample:	No
Soil Sample:	No
Soil Gas:	No
Site Inspect:	No
Soil Excavate:	No
Geo Probe:	No
Survey:	No
Potable Well Sample:	No
Sample MWS:	No
Ground Water Gauging:	No
Soil Venting:	No
Active:	Yes
NOV Action:	None
NOV Issued:	Not reported
NOV Due:	Not reported
NOV Received:	Not reported
NOV Closed:	Not reported
NOV Disc Date:	Not reported
NOV Issued Date:	Not reported
NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	0
Lph Wells:	0
User Stamp:	Ken Holloway/aforrest
Date Stamp:	09/17/2008
Correspondence:	Not reported
Environmental Impact:	Not reported
FollowUp:	Not reported
GW Comments:	Not reported
Location Desc:	Not reported
NOV Comments:	Not reported
Release Desc:	Not reported
Running Comments:	Spill case #2008-04611 is not a LUST and it was not remediated in July 2008.
Work Performed:	Not reported

MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Site

Database(s)

EDR ID Number  
EPA ID Number

11  
SSW  
1/8-1/4  
0.195 mi.  
1030 ft.

**LAMACHIA WILLIAM  
6 WELLINGTON ST  
NEW BRITAIN, CT 06053**

**CT MANIFEST S109750555  
N/A**

**Relative:  
Higher**

CT MANIFEST:

**Actual:  
167 ft.**

Detail:

Year: 1999  
 Manifest Id: MAK079301  
 EPA ID: CTP000023032  
 TSDF EPA ID: MAD047075734  
 TSDF Name: JONES ENVIRO SERVICES NE INC  
 TSDF Address: 263 HOWARD ST  
 TSDF City,St,Zip: LOWELL, MA 01851  
 TSDF Country: USA  
 TSDF Telephone: Not reported  
 Transport Date: 10/06/1999  
 Transporter EPA ID: CTD983896341  
 Transporter Name: WASTE MGMT OF CT INC  
 Transporter Address: Not reported  
 Transporter City,St,Zip: CT  
 Transporter Country: USA  
 Transporter Phone: Not reported  
 Trans 2 Date: Not reported  
 Trans 2 EPA ID: Not reported  
 Trans 2 Name: Not reported  
 Trans 2 Address: Not reported  
 Trans 2 City,St,Zip: CT  
 Trans 2 Country: USA  
 Trans 2 Phone: Not reported  
 Generator Phone: Not reported  
 Generator Mailing Addr: 6 WELLINGTON ST  
 Generator Mailing City/State/Zip: 06053  
 Generator Mailing Country: USA  
 Special Handling: Not reported  
 Discrepancies: No  
 Date Shipped: 10/06/1999  
 Date Received: 10/07/1999  
 Last modified date: 04/26/2004  
 Last modified by: IG  
 Comments: Not reported

Waste:

Year: 1999  
 Manifest Id: MAK079301  
 Waste Occurrence: 1  
 UNNA: 3077  
 Hazard Class: 9  
 US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
 No of Containers: 001  
 Container Type: CF  
 Quantity: 350  
 Weight/Volume: P  
 Additional Description: Not reported  
 Handling Code: Not reported  
 Date Record Was Last Modified: 2004-04-26 00:00:00  
 DEO Who Last Modified Record: IG



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**LAMACHIA WILLIAM (Continued)**

**S109750555**

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-26 00:00:00

12  
ESE  
1/8-1/4  
0.242 mi.  
1276 ft.

**NEW HAVEN HOUSING AUTHORITY  
87 FOXON RD  
NEW BRITAIN, CT 06509**

**CT MANIFEST S109745483  
N/A**

**Relative:  
Lower**

CT MANIFEST:

**Actual:  
130 ft.**

Detail:

Year: 1994  
Manifest Id: CTF0368635  
EPA ID: CTP000017098  
TSDf EPA ID: TND981920119  
TSDf Name: ALLWORTH INC  
TSDf Address: 101 SOUTH PARK DR  
TSDf City,St,Zip: MOUNT PLEASANT, TN 38474  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 11/28/1994  
Transporter EPA ID: MAD019371079  
Transporter Name: GENERAL CHEMICAL CORP  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: Not reported  
Generator Mailing Addr: 87 FOXON RD  
Generator Mailing City/State/Zip: 06509  
Generator Mailing Country: USA  
Special Handling: Yes  
Discrepancies: No  
Date Shipped: 11/28/1994  
Date Received: 12/12/1994  
Last modified date: 04/26/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 1994  
Manifest Id: CTF0368635  
Waste Occurrence: 1  
UNNA: 1263  
Hazard Class: 3  
US Dot Description: WASTE PAINT RELATED MATERIAL  
No of Containers: 001  
Container Type: DM

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NEW HAVEN HOUSING AUTHORITY (Continued)**

**S109745483**

Quantity: 55  
Weight/Volume: G  
Additional Description: Y  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-26 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-26 00:00:00

13  
SW  
1/4-1/2  
0.278 mi.  
1468 ft.

**MICHAEL WANIK  
44 STEWART STREET  
NEW BRITAIN, CT 6051**

**CT LUST S105441144  
CT SPILLS N/A  
CT CPCS**

**Relative:  
Higher**

**LUST:**

**Actual:  
173 ft.**

LUST Id: 6335  
UST Facility Id: Not reported  
LUST Case Id: 34460  
Lust Status: Lust Completed  
Processing Status: Not reported  
EPA Reportable: 0  
Motor Fuel: No  
Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: No  
Piping: No  
Overfill: No  
Removal: No  
Incident Date: 07/29/1998  
Entry Date: Not reported  
Site Case Id: 9804924  
UST Site Id: Not reported  
Cost Recovery Spill Case #: Not reported  
Old SITS Number: Not reported  
Case Log Id: Not reported  
Monthly Report Id: 0  
UST Owner Id: Not reported  
LUST Owner Id: Not reported  
UST Event Id: 6450  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Not reported  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**MICHAEL WANIK (Continued)**

**S105441144**

Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: Yes  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: Yes  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: Not reported  
Resp Party Address: Not reported  
Resp Party City,St,Zip: Not reported  
Resp Party Town Number: UNKNOWN  
Resp Party Phone: Not reported  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 35  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: Not reported  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: Not reported  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlayed: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**MICHAEL WANIK (Continued)**

**S105441144**

Fund Judgment:	No
Fund Recovered:	No
Cellar Borings:	No
Install Micro Wells:	No
Ground Water Sample:	No
Soil Sample:	No
Soil Gas:	No
Site Inspect:	No
Soil Excavate:	No
Geo Probe:	No
Survey:	No
Potable Well Sample:	No
Sample MWS:	No
Ground Water Gauging:	No
Soil Venting:	No
Active:	No
NOV Action:	None
NOV Issued:	Not reported
NOV Due:	Not reported
NOV Received:	Not reported
NOV Closed:	Not reported
NOV Disc Date:	Not reported
NOV Issued Date:	Not reported
NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	Not reported
Lph Wells:	Not reported
User Stamp:	Not reported
Date Stamp:	Not reported
Correspondence:	Not reported
Environmental Impact:	Not reported
FollowUp:	Not reported
GW Comments:	Not reported
Location Desc:	Not reported
NOV Comments:	Not reported
Release Desc:	Not reported
Running Comments:	#2 fuel oil, , 550 LUST removed, contaminated soil excavated, samples taken.
Work Performed:	Not reported

**SPILLS:**

Year of Database:	1998
Case Number:	9804924

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**MICHAEL WANIK (Continued)**

**S105441144**

Who Took Spill: 916  
Assigned To: 0  
Report Date: 07/29/1998  
Report Time: 09:39:00  
Date Release: 07/29/1998  
Time Responded: 09:39:00  
Reported By: eddie malicki  
Phone: 860 8262657  
Representing: fire marshal's office  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: Closed  
Continuous Spill: False  
Released Substance: #2 FUEL OIL  
Qty: 0 (Gallons)  
Emergency Measure: 550 LUST removed, contaminated soil excavated, samples taken.  
Water Body: Not reported  
Discharger: michael wanik  
Telephone: Not reported  
Responsible Party: YES  
RP Address 1: Not reported  
RP City,St,Zip: CT  
Historic: False  
Waterbody: False  
Time Stamp: 1998-07-29 09:39:04  
Sr Inspector: Stavola, Rosanne  
At Inspctor: \*\*NO RESPONSE  
User Stamp: Not reported  
Comments: Not reported  
Action: Removed Tank  
Other Action: Not reported  
Action: Soil Removed  
Other Action: Not reported  
Agency ID: Local Fire Marshal  
Other Agency: Not reported  
DEP Bureau: Not reported  
DEP Agency: Not reported  
Agency ID: DEP  
Other Agency: Not reported  
DEP Bureau: BUREAU OF WASTE MANAGEMENT  
DEP Agency: OIL AND CHEMICAL SPILL RESPONSE  
Cause ID: Inground Tank Failure  
Other Cause: Not reported  
Media ID: Ground Surface  
Other Media: Not reported  
Release Type: petroleum  
Other Release: Not reported

**CPCS:**

Site Type: LUST  
Lust Status code: 4  
Lust Status: Lust Completed (DEP's significant hazard definition)  
PTP Form: Not reported  
Program: Not reported  
Comments: #2 Fuel Oil, , 550 Lust Removed, Contaminated Soil Excavated, Samples Taken.

MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Site

Database(s)

EDR ID Number  
EPA ID Number

**MICHAEL WANIK (Continued)**

**S105441144**

Site Type Definition: Leaking Underground Storage Tanks Completed

**D14  
NNW  
1/4-1/2  
0.316 mi.  
1669 ft.**

**COLLEGE GETTY  
1707 STANLEY ST.  
NEW BRITAIN, CT 06051**

**CT CPCS**

**S105456173  
N/A**

**Site 1 of 2 in cluster D**

**Relative:  
Lower**

CPCS:

Site Type: LUST  
Lust Status code: 3

**Actual:  
141 ft.**

Lust Status: Cleanup Initiated  
PTP Form: Not reported  
Program: Not reported  
Comments: Ust Facility Notification Form No: 89-2911 According To The Ust Facility Notification Dated: 3/4/92, 2x6k Gasoline Usts Were Removed From The Facility In January Of 1989. Tanks Were Installed In January Of 1950.

Site Type Definition: Leaking Underground Storage Tanks Rem. Started

**D15  
NNW  
1/4-1/2  
0.316 mi.  
1669 ft.**

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856  
1707 STANLEY STREET  
NEW BRITAIN, CT 6051**

**CT LUST  
CT SPILLS**

**S101816540  
N/A**

**Site 2 of 2 in cluster D**

**Relative:  
Lower**

LUST:

LUST Id: 468  
UST Facility Id: 2911  
LUST Case Id: 28494  
Lust Status: Cleanup Initiated  
Processing Status: Not reported  
EPA Reportable: -1  
Motor Fuel: Yes  
Diesel: No  
Gasoline: Yes  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: Yes  
Piping: No  
Overfill: No  
Removal: Yes  
Incident Date: 01/23/1989  
Entry Date: Not reported  
Site Case Id: Not reported  
UST Site Id: Not reported  
Cost Recovery Spill Case #: Not reported  
Old SITS Number: Not reported  
Case Log Id: Not reported  
Monthly Report Id: 0  
UST Owner Id: 2643  
LUST Owner Id: Not reported  
UST Event Id: 467  
Contact Info: Not reported

**Actual:  
141 ft.**

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856) (Continued)**

**S101816540**

Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Not reported  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: TKOZLOFFE@GREENVALLEYOIL.COM  
Resp Party Name: Green Valley Oil, LLC  
Resp Party Address: 141 Main Street  
Resp Party City,St,Zip: South Portland, ME 41064388  
Resp Party Town Number: Not reported  
Resp Party Phone: 8002894388  
Resp Party Fax: 2077998316  
Resp Party Name 2: Jerry Kozloff (Compliance Clerk)  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 31  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856) (Continued)**

**S101816540**

Geo Setting:	Not reported
Ground Water Classification:	GA
Receptor:	Not reported
Ground Water Flow Direction:	Not reported
Ground Water Depth:	Not reported
Areas Of Concern:	Not reported
Free Product Inches:	Not reported
Fund Date:	Not reported
Fund Planned:	No
Fund Obligated:	No
Fund Outlaid:	No
Fund Judgment:	No
Fund Recovered:	No
Cellar Borings:	No
Install Micro Wells:	No
Ground Water Sample:	No
Soil Sample:	No
Soil Gas:	No
Site Inspect:	No
Soil Excavate:	Yes
Geo Probe:	No
Survey:	No
Potable Well Sample:	No
Sample MWS:	No
Ground Water Gauging:	No
Soil Venting:	No
Active:	No
NOV Action:	None
NOV Issued:	Not reported
NOV Due:	Not reported
NOV Received:	Not reported
NOV Closed:	Not reported
NOV Disc Date:	Not reported
NOV Issued Date:	Not reported
NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	Not reported
Lph Wells:	Not reported
User Stamp:	forresta/forresta
Date Stamp:	12/31/2014
Correspondence:	Not reported
Environmental Impact:	Not reported
FollowUp:	Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856) (Continued)**

**S101816540**

GW Comments: Not reported  
Location Desc: Not reported  
NOV Comments: Not reported  
Release Desc: Not reported  
Running Comments: UST Enforcement Files, Spills Files, and LUST FilesOpen LUST  
Cases:F89-02911  
Work Performed: Not reported

**SPILLS:**

Year of Database: 1992  
Case Number: 5558  
Who Took Spill: Not reported  
Assigned To: Not reported  
Report Date: 10/16/1992  
Report Time: 6  
Date Release: Not reported  
Time Responded: Not reported  
Reported By: OPERATOR 1  
Phone: Not reported  
Representing: Not reported  
Terminated: Y  
Recovd (Total): .  
Total (Water): .  
Facility Status: Not reported  
Continuous Spill: Not reported  
Released Substance: Not reported  
Qty: 1 (Gallons)  
Emergency Measure: Not reported  
Water Body: Not reported  
Discharger: Not reported  
Telephone: Not reported  
Responsible Party: Not reported  
RP Address 1: Not reported  
RP City,St,Zip: Not reported  
Historic: Not reported  
Waterbody: Not reported  
Time Stamp: Not reported  
Sr Inspector: Not reported  
At Inspctor: Not reported  
User Stamp: Not reported  
Comments: Not reported

Year of Database:1992  
Town of Spill: NEW BRITAIN  
Case Number: 5558  
OCSR Inspector:NR  
Spill Date: 10/16/92  
Spill Time: 6: 27  
Report Date: 10/16/92  
Report Time: 6: 42  
Reported By: OPERATOR 1  
Representing: NEW BRITAIN F D  
Work Telephone: 203- 826- 3000  
Home Telephone: Not reported  
Telephone Pole#: .  
Incident Type: CHEMICAL  
Substance: ANTI FREEZE

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856) (Continued)**

**S101816540**

Quantity: 1 Gallon(s)  
Concentration: .  
Action Desc: Not reported  
On Going: Not reported  
Continuous Spill: Not reported  
Release Status: Terminated, Contained  
Misc Info: PER DISPATCHER NO HAZ MAT UNIT NEEDED AT SCENE  
Water Body: Not reported  
Other Media: Not reported  
Release Area: Ground Surface  
Total (Water): .  
Recovd (Water): .  
Recovd (Total): .  
Polluter Name: Not reported  
Polluted Address: Not reported  
Polluted City,St,Zip: .  
Polluter Phone: .- .- .  
Polluter Responsibility: Not reported  
Unknown Responsibility: Not reported  
Unknown Polluter: Not reported  
Cleanup Action: SANDED  
Dun and Bradst#: Not reported  
UST Unit: Not reported  
Agency Notified: Not reported  
State Agency: Not reported  
Notify Date: 10/16/92  
Notify Time: 6: 42  
Other Agency: Not reported  
Notify Other: Not reported  
Notify Status: Not reported  
Class1: Private  
Other Class: Not reported  
Cause1: Motor Vehicle Accident  
Other Cause: Not reported  
Actions1: Sanded  
Other Actions: Not reported  
Cleanup Contractor: Not reported  
Contractor Name: Not reported  
Did DEP Hire Contractor: Not reported  
Date Contractor Hired: .  
When Contractor Requested: Not reported  
When Contractor Arrived: Not reported  
Who Took Spill: Not reported  
Badge # of Who Recieved Spill: 205  
Who Assigned Spill: NR  
Badge # of Who Assigned Spill: .  
Date Assigned: .  
Assigned Time: Not reported  
Spill Status: Closed  
Case 1136: Not reported  
Federal 311K: .  
Case #1: Not reported  
Case #2: .  
Cost Recovery: .  
Property Owner: Not reported  
Property Other: .  
Property Name: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GVO (FORMER COLLEGE GETTY AND GETTY STATION #06856) (Continued)**

**S101816540**

Property Addr: Not reported  
Property CSZ: .  
Polluter: Not reported  
Owner: Not reported  
Operator: Not reported  
Vehicle Make: Not reported  
Vehicle Model: Not reported  
Truck Reg: Not reported  
Trail Reg: Not reported  
Additional Info: Not reported  
Updated: Not reported  
Update Date: .

**16  
SW  
1/4-1/2  
0.399 mi.  
2105 ft.**

**BALDUCCI PROPERTY  
2 DIXON STREET  
NEW BRITAIN, CT**

**CT LUST S106054114  
CT SPILLS N/A**

**Relative:  
Higher**

**LUST:**

**Actual:  
181 ft.**

LUST Id: 0  
UST Facility Id: 0  
LUST Case Id: 49492  
Lust Status: Cleanup Initiated  
Processing Status: Not reported  
EPA Reportable: -1  
Motor Fuel: No  
Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: No  
Piping: No  
Overfill: No  
Removal: No  
Incident Date: 04/14/2003  
Entry Date: 02/03/2009  
Site Case Id: 200302838  
UST Site Id: 0  
Cost Recovery Spill Case #: 0  
Old SITS Number: 0  
Case Log Id: 0  
Monthly Report Id: 0  
UST Owner Id: 0  
LUST Owner Id: Not reported  
UST Event Id: 0  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Not reported  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**BALDUCCI PROPERTY (Continued)**

**S106054114**

2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Absolute Tank Removal  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: 2038829391  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: Bruno Balducci  
Resp Party Address: 2 Dixon Street  
Resp Party City,St,Zip: New Britain, CT  
Resp Party Town Number: 89  
Resp Party Phone: 8602251260  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 24  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: Not reported  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: 0  
Fund Date: Not reported  
Fund Planned: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**BALDUCCI PROPERTY (Continued)**

**S106054114**

Fund Obligated:	No
Fund Outlaid:	No
Fund Judgment:	No
Fund Recovered:	No
Cellar Borings:	No
Install Micro Wells:	No
Ground Water Sample:	No
Soil Sample:	No
Soil Gas:	No
Site Inspect:	No
Soil Excavate:	No
Geo Probe:	No
Survey:	No
Potable Well Sample:	No
Sample MWS:	No
Ground Water Gauging:	No
Soil Venting:	No
Active:	Yes
NOV Action:	None
NOV Issued:	Not reported
NOV Due:	Not reported
NOV Received:	Not reported
NOV Closed:	Not reported
NOV Disc Date:	Not reported
NOV Issued Date:	Not reported
NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	0
Lph Wells:	0
User Stamp:	allison forrest/ForrestA
Date Stamp:	06/28/2013
Correspondence:	Not reported
Environmental Impact:	Not reported
FollowUp:	Not reported
GW Comments:	Not reported
Location Desc:	Not reported
NOV Comments:	Not reported
Release Desc:	Not reported
Running Comments:	Spills FilesOpen LUST Cases:2003-02838
Work Performed:	Not reported

**SPILLS:**

Year of Database: 2003

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**BALDUCCI PROPERTY (Continued)**

**S106054114**

Case Number: 200304707  
Who Took Spill: 931  
Assigned To: 0  
Report Date: 06/24/2003  
Report Time: 10:12:54  
Date Release: 06/23/2003  
Time Responded: 17:00:00  
Reported By: JEANINE MARIN  
Phone: 203 8829391 - 203 6271167  
Representing: ABSOLUTE TANK  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: Closed  
Continuous Spill: False  
Released Substance: GASOLINE  
Qty: 0 (Gallons)  
Emergency Measure: SOME FREE FLOATING PRODUCT ON WATER IN HOLE FOR REMEDIATION SYSTEM/  
TANKS WERE REMOVED ABOUT APRIL 25/ UST ENFORC.WAS THERE  
Water Body: Not reported  
Discharger: GEORGE BALDUCCI OWNS PROPERTY  
Telephone: 860 6658267  
Responsible Party: Not reported  
RP Address 1: 403 ALLEN ST.  
RP City,St,Zip: CT  
Historic: False  
Waterbody: False  
Time Stamp: 2003-06-25 09:54:06  
Sr Inspector: Coss, Brian  
At Inspctor: \*\*NO RESPONSE  
User Stamp: Not reported  
Comments: Not reported  
Action: Soil Removed  
Other Action: Not reported  
Agency ID: DEP  
Other Agency: Not reported  
DEP Bureau: HELEN ROBBINS  
DEP Agency: Not reported  
Media ID: Ground Water  
Other Media: Not reported  
Media ID: Other  
Other Media: MAY BE IN GROUNDWATER  
Release Type: petroleum  
Other Release: Not reported

**E17 PAPA'S DODGE**  
**SE 710 ALLEN ST.**  
**1/4-1/2 NEW BRITAIN, CT 06051**  
**0.403 mi.**  
**2127 ft. Site 1 of 3 in cluster E**

**CT LUST S105840443**  
**CT CPCS N/A**

**Relative:** LUST:  
**Lower** LUST Id: 7695  
UST Facility Id: 1828  
**Actual:** LUST Case Id: 35746  
**107 ft.** Lust Status: Lust Completed  
Processing Status: Not reported  
EPA Reportable: -1

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**PAPA'S DODGE (Continued)**

**S105840443**

Motor Fuel: No  
Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: No  
Piping: No  
Overfill: No  
Removal: No  
Incident Date: 01/13/1989  
Entry Date: Not reported  
Site Case Id: 198902477  
UST Site Id: 621  
Cost Recovery Spill Case #: Not reported  
Old SITS Number: 198902477  
Case Log Id: Not reported  
Monthly Report Id: 0  
UST Owner Id: 1766  
LUST Owner Id: Not reported  
UST Event Id: 7838  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: HRP Associates  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**PAPA'S DODGE (Continued)**

**S105840443**

Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: Domenic Papa  
Resp Party Address: 39 Berkshire Drive  
Resp Party City,St,Zip: Farmington, CT 60322505  
Resp Party Town Number: 52  
Resp Party Phone: 2032258751  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 42  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: GA  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: Not reported  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlayed: No  
Fund Judgment: No  
Fund Recovered: No  
Cellar Borings: No  
Install Micro Wells: No  
Ground Water Sample: No  
Soil Sample: No  
Soil Gas: No  
Site Inspect: No  
Soil Excavate: No  
Geo Probe: No  
Survey: No  
Potable Well Sample: No  
Sample MWS: No  
Ground Water Gauging: No  
Soil Venting: No  
Active: No  
NOV Action: None  
NOV Issued: Not reported  
NOV Due: Not reported  
NOV Received: Not reported  
NOV Closed: Not reported  
NOV Disc Date: Not reported  
NOV Issued Date: Not reported



Map ID  
 Direction  
 Distance  
 Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
 EPA ID Number

**PAPA'S DODGE (Continued)**

**S105840443**

NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	Not reported
Lph Wells:	Not reported
User Stamp:	forresta/forresta
Date Stamp:	08/22/2016
Correspondence:	Not reported
Environmental Impact:	Not reported
FollowUp:	Not reported
GW Comments:	Not reported
Location Desc:	Not reported
NOV Comments:	Not reported
Release Desc:	Not reported
Running Comments:	Spills Files, UST Enforcement Files, Cleanup Fund Files, and LUST Files
Work Performed:	Not reported

**CPCS:**

Site Type:	LUST
Lust Status code:	3
Lust Status:	Cleanup Initiated
PTP Form:	Not reported
Program:	Not reported
Comments:	Ust Cleanup Account Id: 621 According To A Letter To Ct-dep From R.m. Jones & Co Dated 1/13/89, 30yds3 Of Contaminated Soil Was Removed From A Gasoline Tank Grave. It Is Unknown Which Tank Was Removed. Soil Samples Showed Btex Below Ct-dep Standards.
Site Type Definition:	Leaking Underground Storage Tanks Rem. Started

**F18**  
**NNE**  
 1/4-1/2  
 0.407 mi.  
 2147 ft.

**1615 STANLEY STREET**  
**1615 STANLEY ST**  
**NEW BRITAIN, CT 06050**

**Site 1 of 3 in cluster F**

**CT LUST** **S109732395**  
**CT ENF** **N/A**  
**CT MANIFEST**  
**CT NPDES**

**Relative:** LUST:  
**Higher** LUST Id: 0  
 UST Facility Id: 9100  
**Actual:** LUST Case Id: 59436  
 162 ft. Lust Status: Lust Completed  
 Processing Status: Not reported  
 EPA Reportable: 0  
 Motor Fuel: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: No  
Piping: No  
Overfill: No  
Removal: No  
Incident Date: 03/04/2010  
Entry Date: 04/09/2010  
Site Case Id: 0  
UST Site Id: 0  
Cost Recovery Spill Case #: 0  
Old SITS Number: 0  
Case Log Id: 0  
Monthly Report Id: 0  
UST Owner Id: 921  
LUST Owner Id: Not reported  
UST Event Id: 0  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Not reported  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Relocation: No  
Responsible Party: No  
Responsible EMail: honyotskidab@ccsu.edu  
Resp Party Name: Central Connecticut State University  
Resp Party Address: 1615 Stanley Street  
Resp Party City,St,Zip: New Britain, CT 6050  
Resp Party Town Number: 89  
Resp Party Phone: 8608322303  
Resp Party Fax: Not reported  
Resp Party Name 2: David Honyotski (Contact)  
Resp Party Address 2: Not reported  
Resp Party Phone 2: 8608323068  
Investigator Id: 27  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: Not reported  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: 0  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlaid: No  
Fund Judgment: No  
Fund Recovered: No  
Cellar Borings: No  
Install Micro Wells: No  
Ground Water Sample: No  
Soil Sample: No  
Soil Gas: No  
Site Inspect: No  
Soil Excavate: No  
Geo Probe: No  
Survey: No  
Potable Well Sample: No  
Sample MWS: No  
Ground Water Gauging: No  
Soil Venting: No  
Active: Yes  
NOV Action: None  
NOV Issued: Not reported  
NOV Due: Not reported  
NOV Received: Not reported  
NOV Closed: Not reported  
NOV Disc Date: Not reported  
NOV Issued Date: Not reported  
NOV Compliance Sched: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

NOV Admin Order: Not reported  
NOV Referred To Ag: Not reported  
Stop All NOV Actions: No  
Release Invest Rpt: No  
DEP App Letter 1: No  
Correct Action Plan: No  
DEP App Letter 2: No  
Rem Sys Install: No  
Rem Sys Install Date: Not reported  
Closure Date: Not reported  
Rem Sys Monitoring Rpt: No  
Qrtly Gwater Mon Rpts: No  
Closure Req Rpt: No  
DEP Closure Letter: No  
Referred To: Not reported  
No Wells: 0  
Lph Wells: 0  
User Stamp: allison forrest/ForrestA  
Date Stamp: 12/20/2013  
Correspondence: Not reported  
Environmental Impact: Not reported  
FollowUp: Not reported  
GW Comments: Not reported  
Location Desc: Not reported  
NOV Comments: Not reported  
Release Desc: Not reported  
Running Comments: UST Enforcement Files and Spill Files  
Work Performed: Not reported

**ENFORCEMENT:**

Enforcement Action ID: NOVSWDS01161  
Enforcement Type Code: NOV  
Program Id: SWENF  
Enforcement Action Date: 08/10/2001  
Penalty Amount: Not reported  
Sep Amt: Not reported  
Bureau Name: BUREAU OF WASTE MANAGEMENT  
Program: Not reported  
Status: Not reported  
Date of Discovery: Not reported  
Resolution Date: Not reported  
Resolution Type: Not reported  
Staff: Not reported  
ENF Action Comment: Not reported  
Number Violations: Not reported  
Civil Penalty: Not reported  
SEP Description: Not reported  
Associated EIs: Not reported  
Client Affiliation Type: Not reported  
Affiliation Name: Not reported  
Affiliation Address Line1: Not reported  
Affiliation Address Line2: Not reported  
Affiliation City/State/Zip: Not reported  
Contact Title: Not reported  
Contact Name: Not reported  
Contact EMail: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Enforcement Action ID: NVAR16804--11148  
Enforcement Type Code: Notice Of Violation  
Program Id: Not reported  
Enforcement Action Date: 11/18/2011  
Penalty Amount: \$0.00  
Sep Amt: Not reported  
Bureau Name: Air Management  
Program: Air Enforcement  
Status: Active  
Date of Discovery: Not reported  
Resolution Date: Not reported  
Resolution Type: Not reported  
Staff: Marsh Timothy  
ENF Action Comment: 22a-174-44(d)(3)  
Number Violations: Not reported  
Civil Penalty: Not reported  
SEP Description: Not reported  
Associated EIs: Not reported  
Client Affiliation Type: Not reported  
Affiliation Name: Not reported  
Affiliation Address Line1: Not reported  
Affiliation Address Line2: Not reported  
Affiliation City/State/Zip: Not reported  
Contact Title: President  
Contact Name: Kelley J. Roberts  
Contact EMail: Not reported

Enforcement Action ID: NVAR17211--14038  
Enforcement Type Code: Notice Of Violation  
Program Id: Not reported  
Enforcement Action Date: 06/05/2014  
Penalty Amount: \$0.00  
Sep Amt: Not reported  
Bureau Name: Air Management  
Program: Air Enforcement  
Status: Active  
Date of Discovery: 04/22/2014  
Resolution Date: Not reported  
Resolution Type: Not reported  
Staff: Midgette Alyssa  
ENF Action Comment: Failure to maintain records of monthly and 12 month rolling aggregate fuel usage and operating load for the Tecogen Tecochiller engine as required by NSR permit #110-0108.

Number Violations: Not reported  
Civil Penalty: Not reported  
SEP Description: Not reported  
Associated EIs: Not reported  
Client Affiliation Type: Respondent  
Affiliation Name: CONNECTICUT STATE UNIVERSITY SYSTEM  
Affiliation Address Line1: 181 WHITE ST  
Affiliation Address Line2: Not reported  
Affiliation City/State/Zip: DANBURY, CT 06810 6826  
Contact Title: Not reported  
Contact Name: Not reported  
Contact EMail: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

CT MANIFEST:

Detail:

Year: 2008  
Manifest Id: 002079020FLE  
EPA ID: CTD983867367  
TSDf EPA ID: ARD069748192  
TSDf Name: TERIS LLC ( WAS dba DIVISION TRANSPORT AND ENSC  
TSDf Address: 309 AMERICAN CIRCLE  
TSDf City,St,Zip: EL DORADO, AR 71730-  
TSDf Country: USA  
TSDf Telephone: (870)864-3662  
Transport Date: 07/24/2008  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.  
Transporter Address: P.O. BOX 9149  
Transporter City,St,Zip: NORWELL, MA 02061-9149  
Transporter Country: USA  
Transporter Phone: (781)792-5764  
Trans 2 Date: 07/25/2008  
Trans 2 EPA ID: ALD067138891  
Trans 2 Name: ROBBIE D. WOOD, INC.  
Trans 2 Address: P.O. BOX 125  
Trans 2 City,St,Zip: DOLOMITE, AL 35061  
Trans 2 Country: USA  
Trans 2 Phone: (205)744-8440  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 07/24/2008  
Date Received: 08/03/2008  
Last modified date: 02/23/2010  
Last modified by: CYF  
Comments: Not reported

Waste:

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurrence: 1  
UNNA: 1263  
Hazard Class: 3  
US Dot Description: PAINT OR PAINT RELATED MATERIAL  
No of Containers: 1  
Container Type: DM  
Quantity: 450  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurence: 2  
UNNA: 1992  
Hazard Class: 3  
US Dot Description: FLAMMABLE LIQUIDS, TOXIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 195  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurrence: 3  
UNNA: 3175  
Hazard Class: 4.1  
US Dot Description: SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.  
No of Containers: 1  
Container Type: DM  
Quantity: 75  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurence: 5  
UNNA: 1325  
Hazard Class: 4.1  
US Dot Description: FLAMMABLE SOLIDS, ORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 40  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurrence: 6  
UNNA: 3264  
Hazard Class: 8  
US Dot Description: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
No of Containers: 2  
Container Type: DF  
Quantity: 200  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Year: 2008  
Manifest Id: 002079020FLE  
Waste Occurrence: 7  
UNNA: Not reported  
Hazard Class: ORM-D  
US Dot Description: CONSUMER COMMODITY  
No of Containers: 2  
Container Type: DF  
Quantity: 55  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2010-01-07 00:00:00  
DEO Who Last Modified Record: IR  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D008  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D022  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D004  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D005  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D006  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D007  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2010-01-07 00:00:00

**Detail:**

Year: 2007  
Manifest Id: 001038082FLE  
EPA ID: CTD983867367  
TSDf EPA ID: OHD000816629  
TSDf Name: SPRING GROVE RESOURCE RECOVERY  
TSDf Address: 4879 SPRING GROVE AVE  
TSDf City,St,Zip: CINCINNATI, OH 45232-  
TSDf Country: USA  
TSDf Telephone: (513)681-5738  
Transport Date: 10/25/2007  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES INC  
Transporter Address: P.O. BOX 9149  
Transporter City,St,Zip: NORWELL, MA 02061-9149  
Transporter Country: USA

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Transporter Phone: (781)792-5764  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 10/25/2007  
Date Received: 11/05/2007  
Last modified date: 03/24/2009  
Last modified by: JEB  
Comments: Not reported

**Detail:**

Year: 2006  
Manifest Id: CTF1225556  
EPA ID: CTD983867367  
TSDF EPA ID: NCD000648451  
TSDF Name: CLEAN HARBORS REIDSVILLE LLC  
TSDF Address: 208 WATLINGTON INDUSTRIAL DR  
TSDF City,St,Zip: REIDSVILLE, NC 27320-  
TSDF Country: USA  
TSDF Telephone: (336)342-6160  
Transport Date: 07/18/2006  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES INC  
Transporter Address: PO BOX 9149  
Transporter City,St,Zip: NORWELL, MA 02061-9149  
Transporter Country: USA  
Transporter Phone: (781)792-5000  
Trans 2 Date: 07/18/2006  
Trans 2 EPA ID: NJD986607380  
Trans 2 Name: MAUMEE EXPRESS, INC.  
Trans 2 Address: P.O. BOX 278  
Trans 2 City,St,Zip: SOMERVILLE, NJ 08854  
Trans 2 Country: USA  
Trans 2 Phone: (267)590-0043  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 07/18/2006  
Date Received: 07/21/2006  
Last modified date: 09/04/2007  
Last modified by: DMG  
Comments: Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Waste:  
Year: 2006  
Manifest Id: CTF1225556  
Waste Occurrence: 1  
UNNA: 1993  
Hazard Class: 3  
US Dot Description: FLAMMABLE LIQUIDS, N.O.S.  
No of Containers: 001  
Container Type: DF  
Quantity: 200  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2007-08-09 00:00:00  
DEO Who Last Modified Record: DMG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
Year: 2006  
Manifest Id: CTF1225556  
Waste Occurrence: 2  
UNNA: 1950  
Hazard Class: 2.1  
US Dot Description: AEROSOLS, FLAMMABLE  
No of Containers: 001  
Container Type: DF  
Quantity: 35  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2007-08-09 00:00:00  
DEO Who Last Modified Record: DMG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00  
  
EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

Year: 2006  
Manifest Id: CTF1225556  
Waste Occurrence: 3  
UNNA: 2810  
Hazard Class: 6.1  
US Dot Description: TOXIC LIQUIDS, ORGANIC, N.O.S.  
No of Containers: 001  
Container Type: DF  
Quantity: 200  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2007-08-09 00:00:00  
DEO Who Last Modified Record: DMG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: F002  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

Year: 2006  
Manifest Id: CTF1225556  
Waste Occurrence: 4  
UNNA: 1075  
Hazard Class: 2.1  
US Dot Description: WASTE LIQUIFIED PETROLEUM GAS  
No of Containers: 001  
Container Type: CY  
Quantity: 5  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2007-08-09 00:00:00  
DEO Who Last Modified Record: DMG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: F002

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2007-08-09 00:00:00

**Detail:**

Year: 2005  
Manifest Id: ctf1204704  
EPA ID: ctd983867367  
TSDf EPA ID: NCD000648451  
TSDf Name: CLEAN HARBORS REIDSVILLE LLC  
TSDf Address: 208 WATLINGTON INDUSTRIAL DRIVE  
TSDf City,St,Zip: REIDSVILLE, NC 27320-  
TSDf Country: USA  
TSDf Telephone: (336)342-6160  
Transport Date: 05/16/2005  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.  
Transporter Address: 1501 WASHINGTON STREET  
Transporter City,St,Zip: BRAINTREE, MA 02184-  
Transporter Country: USA  
Transporter Phone: (781)849-1800  
Trans 2 Date: 05/14/2005  
Trans 2 EPA ID: ALD067138891  
Trans 2 Name: ROBBIE D. WOOD, INC.  
Trans 2 Address: P.O. BOX 125  
Trans 2 City,St,Zip: DOLOMITE, AL 35061  
Trans 2 Country: USA  
Trans 2 Phone: (205)744-8440  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 05/16/2005  
Date Received: 05/20/2005  
Last modified date: 03/30/2006  
Last modified by: JEB  
Comments: Not reported

**Waste:**

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 1  
UNNA: 1263  
Hazard Class: 3  
US Dot Description: PAINT OR PAINT RELATED MATERIAL  
No of Containers: 1  
Container Type: DM  
Quantity: 50  
Weight/Volume: P  
Additional Description: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 2  
UNNA: 3244  
Hazard Class: 8  
US Dot Description: SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.  
No of Containers: 1  
Container Type: DM  
Quantity: 175  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 3  
UNNA: 3098  
Hazard Class: 5.1  
US Dot Description: OXIDIZING LIQUID, CORROSIVE, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 2  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 4  
UNNA: 3264  
Hazard Class: 8  
US Dot Description: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 90  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 5  
UNNA: 1950  
Hazard Class: 2.1  
US Dot Description: AEROSOLS, FLAMMABLE  
No of Containers: 1  
Container Type: DF  
Quantity: 24  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 6  
UNNA: 3264  
Hazard Class: 8  
US Dot Description: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 70  
Weight/Volume: P  
Additional Description: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 7  
UNNA: 1992  
Hazard Class: 3  
US Dot Description: FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.  
No of Containers: 3  
Container Type: DF  
Quantity: 525  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Year: 2005  
Manifest Id: ctf1204704  
Waste Occurrence: 8  
UNNA: 2809  
Hazard Class: 8  
US Dot Description: MERCURY  
No of Containers: 1  
Container Type: DF  
Quantity: 1  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-03-30 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-03-30 00:00:00

Detail:

Year: 2005  
Manifest Id: ctf1210657  
EPA ID: CTD983867367  
TSDf EPA ID: NCD000648451  
TSDf Name: CLEAN HARBORS REIDSVILLE LLC  
TSDf Address: 208 WATLINGTON INDUSTRIAL DRIVE  
TSDf City,St,Zip: REIDSVILLE, NC 27320-  
TSDf Country: USA  
TSDf Telephone: (336)342-6160  
Transport Date: 02/17/2005  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.  
Transporter Address: P.O. BOX 9149  
Transporter City,St,Zip: NORWELL, MA 02061-9149  
Transporter Country: USA  
Transporter Phone: (781)792-5764  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 02/17/2005  
Date Received: 02/22/2005  
Last modified date: 11/03/2006  
Last modified by: JEB  
Comments: Not reported

Waste:

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 1  
UNNA: 1950  
Hazard Class: 2.1  
US Dot Description: AEROSOLS, FLAMMABLE

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

No of Containers: 1  
Container Type: DF  
Quantity: 25  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 2  
UNNA: 1263  
Hazard Class: 3  
US Dot Description: PAINT OR PAINT RELATED MATERIAL  
No of Containers: 1  
Container Type: DF  
Quantity: 65

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 3  
UNNA: 1498  
Hazard Class: 5.1  
US Dot Description: SODIUM NITRATE  
No of Containers: 1  
Container Type: DF  
Quantity: 1  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 4  
UNNA: 3289  
Hazard Class: 6.1  
US Dot Description: TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 105  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 5  
UNNA: 2809  
Hazard Class: 8  
US Dot Description: MERCURY  
No of Containers: 1  
Container Type: DF  
Quantity: 30  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 6  
UNNA: 2790  
Hazard Class: 8  
US Dot Description: ACETIC ACID SOLUTION  
No of Containers: 1  
Container Type: DF  
Quantity: 10  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 7  
UNNA: 3264  
Hazard Class: 8  
US Dot Description: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 30  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 8  
UNNA: 1479  
Hazard Class: 5.1  
US Dot Description: OXIDIZING SOLID, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 120  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 9  
UNNA: 2924  
Hazard Class: 3  
US Dot Description: FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 95  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Year: 2005  
Manifest Id: ctf1210657  
Waste Occurrence: 10  
UNNA: 3244  
Hazard Class: 8  
US Dot Description: SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.  
No of Containers: 2  
Container Type: DF  
Quantity: 60  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2006-07-24 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: U081  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2006-07-24 00:00:00

**Detail:**

Year: 2004  
Manifest Id: ctf1181874  
EPA ID: CTD983867367  
TSDf EPA ID: NCD000648451  
TSDf Name: CLEAN HARBORS REIDSVILLE LLC  
TSDf Address: 208 WATLINGTON IND DR  
TSDf City,St,Zip: REIDSVILLE, NC 27320-  
TSDf Country: USA  
TSDf Telephone: (336)342-6160  
Transport Date: 06/01/2004  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SVS  
Transporter Address: PO BOX 859048  
Transporter City,St,Zip: BRAINTREE, MA 02185-9048  
Transporter Country: USA  
Transporter Phone: (781)849-1800  
Trans 2 Date: 06/04/2004  
Trans 2 EPA ID: NJD986607380  
Trans 2 Name: MAUMEE EXPRESS, INC.  
Trans 2 Address: P.O. BOX 278  
Trans 2 City,St,Zip: SOMERVILLE, NJ 08854  
Trans 2 Country: USA  
Trans 2 Phone: (732)424-8441  
Generator Phone: 8608322499  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06053  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: Not reported  
Date Shipped: 06/01/2004  
Date Received: 06/08/2004  
Last modified date: 03/07/2005  
Last modified by: JEB  
Comments: Not reported

**Waste:**

Year: 2004  
Manifest Id: ctf1181874

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Waste Occurrence: 1  
UNNA: 2809  
Hazard Class: 8  
US Dot Description: MERCURY  
No of Containers: 1  
Container Type: DF  
Quantity: 20  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2005-03-07 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

Year: 2004  
Manifest Id: ctf1181874  
Waste Occurrence: 2  
UNNA: 1950  
Hazard Class: 2.1  
US Dot Description: AEROSOLS, FLAMMABLE  
No of Containers: 1  
Container Type: DF  
Quantity: 10  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2005-03-07 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Year: 2004  
Manifest Id: ctf1181874  
Waste Occurrence: 3  
UNNA: 3264  
Hazard Class: 8  
US Dot Description: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DF  
Quantity: 5  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2005-03-07 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

Year: 2004  
Manifest Id: ctf1181874  
Waste Occurrence: 4  
UNNA: 3289  
Hazard Class: 6.1  
US Dot Description: TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.  
No of Containers: 1  
Container Type: DM  
Quantity: 100  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2005-03-07 00:00:00  
DEO Who Last Modified Record: JEB  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

EPA Waste Code: D009

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Recycled Waste?: False  
Date Record Was Last Modified: 2005-03-07 00:00:00

Detail:

Year: 2003  
Manifest Id: CTF1113224  
EPA ID: CTD983867367  
TSDf EPA ID: NCD000648451  
TSDf Name: LAIDLAW ENV SERVICES (TS) INC  
TSDf Address: BOX 3 WATLINGTON INDUSTRIAL RD  
TSDf City,St,Zip: REIDSVILLE, NC 27320  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 08/13/2003  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENV SVS INC  
Transporter Address: PO BOX 859048  
Transporter City,St,Zip: BRAINTREE, MA 02185-9048  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: 08/22/2003  
Trans 2 EPA ID: OHD009865825  
Trans 2 Name: DART TRUCKING CO INC  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2038277213  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06050  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: No  
Date Shipped: 08/13/2003  
Date Received: 09/02/2003  
Last modified date: 05/26/2004  
Last modified by: IG  
Comments: Not reported

Detail:

Year: 2002  
Manifest Id: CTF0809931  
EPA ID: CTD983867367  
TSDf EPA ID: CTD000604488  
TSDf Name: CLEAN HARBORS OF CONNECTICUT INC  
TSDf Address: 51 BRODERICK RD  
TSDf City,St,Zip: BRISTOL, CT 06010  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 01/17/2002  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SVS INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2038277213  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06050  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: No  
Date Shipped: 01/17/2002  
Date Received: 01/17/2002  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

**Waste:**

Year: 2002  
Manifest Id: CTF0809931  
Waste Occurrence: 1  
UNNA: 1824  
Hazard Class: 8  
US Dot Description: sodium hydroxide solution  
No of Containers: 003  
Container Type: DF  
Quantity: 80  
Weight/Volume: G  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D002  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

**Detail:**

Year: 2001  
Manifest Id: MAQ030770  
EPA ID: CTD983867367  
TSDf EPA ID: MAD053452637  
TSDf Name: CLEAN HARBORS OF BRAINTREE INC  
TSDf Address: 1 HILL AVE  
TSDf City,St,Zip: BRAINTREE, MA 02184  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 11/27/2001  
Transporter EPA ID: MAD039322250  
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: 11/29/2001  
Trans 2 EPA ID: OHD009865825  
Trans 2 Name: DART TRUCKING CO INC  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2038277213  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06050  
Generator Mailing Country: USA  
Special Handling: Not reported  
Discrepancies: No  
Date Shipped: 11/27/2001  
Date Received: 12/05/2001  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 2001  
Manifest Id: MAQ030770  
Waste Occurrence: 1  
UNNA: 3139  
Hazard Class: 5.1  
US Dot Description: OXIDIZING LIQUID N.O.S.  
No of Containers: 001  
Container Type: DF  
Quantity: 1  
Weight/Volume: G  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D019  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

Year: 2001  
Manifest Id: MAQ030770  
Waste Occurrence: 2  
UNNA: 1846  
Hazard Class: 6.1

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

US Dot Description: WASTE CARBON TETRACHLORIDE  
No of Containers: 001  
Container Type: DF  
Quantity: 2  
Weight/Volume: G  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D019  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

Year: 2001  
Manifest Id: MAQ030770  
Waste Occurrence: 3  
UNNA: 2809  
Hazard Class: 8  
US Dot Description: mercury  
No of Containers: 001  
Container Type: DF  
Quantity: 184  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D019  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

Year: 2001  
Manifest Id: MAQ030770

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Waste Occurrence: 4  
UNNA: 1993  
Hazard Class: 3  
US Dot Description: FLAMMABLE LIQUID N.O.S.  
No of Containers: 001  
Container Type: DF  
Quantity: 2  
Weight/Volume: G  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D019  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D001  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

Detail:

Year: 2000  
Manifest Id: CTF0931633  
EPA ID: CTD983867367  
TSDf EPA ID: CT5000001495  
TSDf Name: NORTHEAST LAMP RECYCLING INC  
TSDf Address: 250 MAIN ST  
TSDf City,St,Zip: EAST WINDSOR, CT 06088  
TSDf Country: USA  
TSDf Telephone: Not reported  
Transport Date: 04/26/2000  
Transporter EPA ID: CT5000001495  
Transporter Name: NORTHEAST LAMP RECYCLING INC  
Transporter Address: Not reported  
Transporter City,St,Zip: CT  
Transporter Country: USA  
Transporter Phone: Not reported  
Trans 2 Date: Not reported  
Trans 2 EPA ID: Not reported  
Trans 2 Name: Not reported  
Trans 2 Address: Not reported  
Trans 2 City,St,Zip: CT  
Trans 2 Country: USA  
Trans 2 Phone: Not reported  
Generator Phone: 2038277213  
Generator Mailing Addr: 1615 STANLEY ST  
Generator Mailing City/State/Zip: 06050  
Generator Mailing Country: USA

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Special Handling: Not reported  
Discrepancies: Yes  
Date Shipped: 04/26/2000  
Date Received: 04/26/2000  
Last modified date: 04/27/2004  
Last modified by: IG  
Comments: Not reported

Waste:

Year: 2000  
Manifest Id: CTF0931633  
Waste Occurrence: 1  
UNNA: 3077  
Hazard Class: 9  
US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
No of Containers: 021  
Container Type: DF  
Quantity: 2400  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

Year: 2000  
Manifest Id: CTF0931633  
Waste Occurrence: 2  
UNNA: 3077  
Hazard Class: 9  
US Dot Description: ENVIRONMENTALLY HAZ. SUBSTANCES,SOLID  
No of Containers: 153  
Container Type: CF  
Quantity: 1700  
Weight/Volume: P  
Additional Description: Not reported  
Handling Code: Not reported  
Date Record Was Last Modified: 2004-04-27 00:00:00  
DEO Who Last Modified Record: IG  
EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

EPA Waste Code: D009  
Recycled Waste?: False  
Date Record Was Last Modified: 2004-04-27 00:00:00

[Click this hyperlink](#) while viewing on your computer to access  
8 additional CT MANIFEST: record(s) in the EDR Site Report.

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

NPDES:

Town Id: 89  
Company Name: BOARD OF TRUSTEES CONNECTICUT STATE UNIVERSITY SYSTEM  
Permit Number: GSN000109  
Permit Issued Date: 05/18/1998  
Permit Expiration Date: 10/01/2002  
Application Received Date: 04/01/1998  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: CENTRAL CT STATE UNIVERSITY  
Permit Number: GSN000109  
Permit Issued Date: 05/18/1998  
Permit Expiration Date: 10/01/2002  
Application Received Date: 04/01/1998  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: LAWRENCE BRUNOLI INC  
Permit Number: GSN000407  
Permit Issued Date: 07/13/2000  
Permit Expiration Date: 10/01/2002  
Application Received Date: 07/13/2000  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

1615 STANLEY STREET (Continued)

S109732395

Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: LAWRENCE BRUNOLI, INC.  
Permit Number: GSN000407  
Permit Issued Date: 07/13/2000  
Permit Expiration Date: 10/01/2002  
Application Received Date: 07/13/2000  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: BOARD OF TRUSTEES CONNECTICUT STATE UNIVERSITY SYSTEM  
Permit Number: GPP000074  
Permit Issued Date: 12/14/2001  
Permit Expiration Date: 05/24/2005  
Application Received Date: 10/18/2001  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: BOARD OF TRUSTEES CONNECTICUT STATE UNIVERSITY SYSTEM  
Permit Number: GSN000182  
Permit Issued Date: 11/10/1998  
Permit Expiration Date: 10/01/2002  
Application Received Date: 11/10/1998  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**1615 STANLEY STREET (Continued)**

**S109732395**

Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: CENTRAL CONNECTICUT STATE UNIVERSITY  
Permit Number: GSN000182  
Permit Issued Date: 11/10/1998  
Permit Expiration Date: 10/01/2002  
Application Received Date: 11/10/1998  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: Not reported  
Company Name: Not reported  
Permit Number: GSN003093  
Permit Issued Date: 12/09/2016  
Permit Expiration Date: 09/30/2018  
Application Received Date: Not reported  
Affiliation Type: Registrant  
Permit EI Type: Stormwater Construction Activities GP locally exempt 1 to <20 acres  
App Id: 201613361  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Active  
Affiliate Address Line 1: 200 STANLEY ST  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: NEW BRITAIN, CT 06051-3629  
Contact Name: Frank J. Tomcak  
Contact Title: Sr. Proj. Mgr.  
Contact EMail: ftomcak@downesco.com

**F19**  
**NNE**  
**1/4-1/2**  
**0.407 mi.**  
**2147 ft.**

**C.C.S.U.**  
**1615 STANLEY ST POWER PLANT**  
**NEW BRITAIN, CT 06051**  
**Site 2 of 3 in cluster F**

**CT CPCS S110775107**  
**N/A**

**Relative:**  
**Higher**

CPCS:  
Site Type: LUST  
Lust Status code: 2  
Lust Status: Investigation  
PTP Form: Not reported

**Actual:**  
**162 ft.**

MAP FINDINGS

Map ID Direction Distance Elevation		Database(s)	EDR ID Number EPA ID Number
--	--	-------------	--------------------------------

**C.C.S.U. (Continued)**

**S110775107**

Program: Not reported  
 Comments: Not reported  
 Site Type Definition: Leaking Underground Storage Tanks Investigation

<b>F20</b> <b>NNE</b> <b>1/4-1/2</b> <b>0.407 mi.</b> <b>2147 ft.</b>	<b>CENTRAL CONN STATE COLLEGE</b> <b>1615 STANLEY STREET (WELL RD.)</b> <b>NEW BRITAIN, CT 06051</b>  <b>Site 3 of 3 in cluster F</b>	<b>CT CPCS</b>	<b>S105456594</b> <b>N/A</b>
---	---	----------------	---------------------------------

<b>Relative:</b> <b>Higher</b>	<b>CPCS:</b>	
	Site Type: LUST Lust Status code: 3	
<b>Actual:</b> <b>162 ft.</b>	<b>Lust Status:</b> Cleanup Initiated <b>PTP Form:</b> Not reported <b>Program:</b> Not reported <b>Comments:</b> Ust Facility Notification Id: 89-9100 According To Ust Facility Notification Dated: 9/16/87, 2x25k Usts Were Abandoned In Place. According To The Ust Facility Notification Form Dated 11/16/93, 1x1k Transformer Wo And 1x1k Wo Usts Were Removed From	
	<b>Site Type Definition:</b> Leaking Underground Storage Tanks Rem. Started	

<b>21</b> <b>ESE</b> <b>1/4-1/2</b> <b>0.433 mi.</b> <b>2288 ft.</b>	<b>WINSLOW AUTOMATIC</b> <b>23 SAINT CLAIR AVENUE</b> <b>NEW BRITAIN, CT 06051</b>	<b>CT LUST</b> <b>CT CPCS</b>	<b>S105457652</b> <b>N/A</b>
--	--	----------------------------------	---------------------------------

<b>Relative:</b> <b>Lower</b>	<b>LUST:</b>	
	LUST Id: 3168 UST Facility Id: 2403	
<b>Actual:</b> <b>100 ft.</b>	<b>LUST Case Id:</b> 31217 <b>Lust Status:</b> Cleanup Initiated <b>Processing Status:</b> Not reported <b>EPA Reportable:</b> 0 <b>Motor Fuel:</b> No <b>Diesel:</b> No <b>Gasoline:</b> No <b>Other:</b> Yes <b>Other Release:</b> Waste Oil <b>No Release:</b> No <b>Leak:</b> No <b>Tank:</b> No <b>Piping:</b> No <b>Overfill:</b> No <b>Removal:</b> No <b>Incident Date:</b> 07/30/1997 <b>Entry Date:</b> Not reported <b>Site Case Id:</b> 9704146 <b>UST Site Id:</b> Not reported <b>Cost Recovery Spill Case #:</b> Not reported <b>Old SITS Number:</b> Not reported <b>Case Log Id:</b> Not reported <b>Monthly Report Id:</b> 0 <b>UST Owner Id:</b> 7836 <b>LUST Owner Id:</b> Not reported	



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WINSLOW AUTOMATIC (Continued)**

**S105457652**

UST Event Id: 3191  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN, UNKNOWN  
2nd Contact: Not reported  
2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: New Britain Ave  
Site Contact Address: xx  
Site Contact Add 2: Not reported  
Site Contact City 2: ZipCode Unknown  
Site Contact Phone: (860) 826-3000  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: Yes  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: Not reported  
Resp Party Address: Not reported  
Resp Party City,St,Zip: Not reported  
Resp Party Town Number: UNKNOWN  
Resp Party Phone: Not reported  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 19  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WINSLOW AUTOMATIC (Continued)**

**S105457652**

Hydro Basin:	Not reported
Drastic:	Not reported
Geo Setting:	Not reported
Ground Water Classification:	Not reported
Receptor:	Not reported
Ground Water Flow Direction:	Not reported
Ground Water Depth:	Not reported
Areas Of Concern:	Not reported
Free Product Inches:	Not reported
Fund Date:	Not reported
Fund Planned:	No
Fund Obligated:	No
Fund Outlaid:	No
Fund Judgment:	No
Fund Recovered:	No
Cellar Borings:	No
Install Micro Wells:	No
Ground Water Sample:	No
Soil Sample:	No
Soil Gas:	No
Site Inspect:	No
Soil Excavate:	No
Geo Probe:	No
Survey:	No
Potable Well Sample:	No
Sample MWS:	No
Ground Water Gauging:	No
Soil Venting:	No
Active:	No
NOV Action:	None
NOV Issued:	Not reported
NOV Due:	Not reported
NOV Received:	Not reported
NOV Closed:	Not reported
NOV Disc Date:	Not reported
NOV Issued Date:	Not reported
NOV Compliance Sched:	Not reported
NOV Admin Order:	Not reported
NOV Referred To Ag:	Not reported
Stop All NOV Actions:	No
Release Invest Rpt:	No
DEP App Letter 1:	No
Correct Action Plan:	No
DEP App Letter 2:	No
Rem Sys Install:	No
Rem Sys Install Date:	Not reported
Closure Date:	Not reported
Rem Sys Monitoring Rpt:	No
Qrtly Gwater Mon Rpts:	No
Closure Req Rpt:	No
DEP Closure Letter:	No
Referred To:	Not reported
No Wells:	Not reported
Lph Wells:	Not reported
User Stamp:	Not reported
Date Stamp:	Not reported
Correspondence:	Not reported

Map ID  
 Direction  
 Distance  
 Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
 EPA ID Number

**WINSLOW AUTOMATIC (Continued)**

**S105457652**

Environmental Impact: Not reported  
 FollowUp: Not reported  
 GW Comments: Not reported  
 Location Desc: Not reported  
 NOV Comments: Not reported  
 Release Desc: Not reported  
 Running Comments: Not reported  
 Work Performed: Not reported

**CPCS:**

Site Type: LUST  
 Lust Status code: 3  
 Lust Status: Cleanup Initiated  
 PTP Form: Not reported  
 Program: Not reported  
 Comments: Not reported  
 Site Type Definition: Leaking Underground Storage Tanks Rem. Started

**E22**  
**SE**  
 1/4-1/2  
 0.440 mi.  
 2322 ft.

**JH METAL FINISHING, INC.**  
**1146 EAST ST**  
**NEW BRITAIN, CT 06051**  
 Site 2 of 3 in cluster E

**CT LUST**  
**CT SPILLS**  
**CT AIRS**  
**CT ENF**  
**CT NPDES**

**S108306671**  
**N/A**

**Relative:**  
**Lower**

**LUST:**

**Actual:**  
**101 ft.**

LUST Id: 0  
 UST Facility Id: 0  
 LUST Case Id: 61005  
 Lust Status: Investigation  
 Processing Status: Not reported  
 EPA Reportable: -1  
 Motor Fuel: Yes  
 Diesel: Yes  
 Gasoline: No  
 Other: No  
 Other Release: Not reported  
 No Release: No  
 Leak: No  
 Tank: Yes  
 Piping: No  
 Overfill: No  
 Removal: Yes  
 Incident Date: 01/06/2016  
 Entry Date: 01/07/2016  
 Site Case Id: 201600097  
 UST Site Id: 0  
 Cost Recovery Spill Case #: 0  
 Old SITS Number: 0  
 Case Log Id: 0  
 Monthly Report Id: 0  
 UST Owner Id: 0  
 LUST Owner Id: Not reported  
 UST Event Id: 0  
 Contact Info: Not reported  
 Contact EMail: coordinator@teddyoil.com  
 Site Contact City,St,Zip: 77, CT 6040  
 2nd Contact: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

2nd Contact EMail: Not reported  
2nd Contact Address: Not reported  
2nd Contact City,St,Zip: UNKNOWN  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Not reported  
2nd Contact Phone Number: Not reported  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Rosemary Rainville (Tankworks Removal & Replacement LLC)  
Site Contact Address: 360 East Center Street  
Site Contact Add 2: Not reported  
Site Contact City 2: Manchester  
Site Contact Phone: 8606463348  
Site Contact Fax: Not reported  
Site Contact Type: Owner  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Not reported  
Resp Party Name: JH Metal Finishing  
Resp Party Address: 1146 East Street  
Resp Party City,St,Zip: New Britain, CT  
Resp Party Town Number: 89  
Resp Party Phone: Not reported  
Resp Party Fax: Not reported  
Resp Party Name 2: Not reported  
Resp Party Address 2: Not reported  
Resp Party Phone 2: Not reported  
Investigator Id: 0  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: GA  
Receptor: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: 0  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlaid: No  
Fund Judgment: No  
Fund Recovered: No  
Cellar Borings: No  
Install Micro Wells: No  
Ground Water Sample: No  
Soil Sample: Yes  
Soil Gas: No  
Site Inspect: No  
Soil Excavate: Yes  
Geo Probe: No  
Survey: No  
Potable Well Sample: No  
Sample MWS: No  
Ground Water Gauging: No  
Soil Venting: No  
Active: Yes  
NOV Action: None  
NOV Issued: Not reported  
NOV Due: Not reported  
NOV Received: Not reported  
NOV Closed: Not reported  
NOV Disc Date: Not reported  
NOV Issued Date: Not reported  
NOV Compliance Sched: Not reported  
NOV Admin Order: Not reported  
NOV Referred To Ag: Not reported  
Stop All NOV Actions: No  
Release Invest Rpt: No  
DEP App Letter 1: No  
Correct Action Plan: No  
DEP App Letter 2: No  
Rem Sys Install: No  
Rem Sys Install Date: Not reported  
Closure Date: Not reported  
Rem Sys Monitoring Rpt: No  
Qrtly Gwater Mon Rpts: No  
Closure Req Rpt: No  
DEP Closure Letter: No  
Referred To: Not reported  
No Wells: 0  
Lph Wells: 0  
User Stamp: forresta/forresta  
Date Stamp: 03/29/2016  
Correspondence: Not reported  
Environmental Impact: Not reported  
FollowUp: Not reported  
GW Comments: Not reported  
Location Desc: Not reported  
NOV Comments: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Release Desc: Not reported  
Running Comments: Spills FilesOpen LUST Cases:2016-00097  
Work Performed: Not reported

**SPILLS:**

Year of Database: 2007  
Case Number: 200700698  
Who Took Spill: 207  
Assigned To: 926  
Report Date: 02/02/2007  
Report Time: 04:28:43  
Date Release: 02/02/2007  
Time Responded: 04:28:00  
Reported By: DISPATCHER  
Phone: 860 8263000  
Representing: NEW BRITAIN FIRE DEPARTMENT  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: CLOSED  
Continuous Spill: False  
Released Substance: BROWN SUBSTANCE  
Qty: 0 (Gallons)  
Emergency Measure: REFERRED TO 934  
Water Body: Not reported  
Discharger: Not reported  
Telephone: Not reported  
Responsible Party: Not reported  
RP Address 1: Not reported  
RP City,St,Zip: CT  
Historic: False  
Waterbody: False  
Time Stamp: 2007-03-13 08:23:32  
Sr Inspector: Gilmore, Pete  
At Inspctor: CATUCCIO, DEBBIE  
User Stamp: mgranill  
Comments: Not reported  
Action: Referred  
Other Action: Not reported  
Cause ID: Seepage  
Other Cause: Not reported  
Media ID: Ground Water  
Other Media: Not reported  
Media ID: Ground Surface  
Other Media: Not reported  
Class ID: Commercial  
Other Class: Not reported  
Release Type: chemical  
Other Release: Not reported  
Waterbody: Catch Basin  
Other Wtrbody: Not reported

**AIRS:**

OBS: Not reported  
Client No.: Not reported  
Town No.: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Prem No.:	Not reported
Contact:	Not reported
Phone# Area Code:	Not reported
Mail Street:	Not reported
Mail Town:	Not reported
Mail State:	Not reported
Mail Zip:	Not reported
X Utm Grid:	Not reported
Y Utm Grid:	Not reported
Sic:	Not reported
Permit No:	110-0221-R
Description:	Not reported
Date Permit Issued:	01/01/1970
Date Permit Expires:	Not reported
Carbon Monoxide Emissions (TPY):	Not reported
Actual Pm10(TPY):	Not reported
Actual So(TPY):	Not reported
Actual Nox(TPY):	Not reported
Actual Hc(TPY):	Not reported
Contact Title:	Not reported
Contact Email:	Not reported
Affiliation Type:	Not reported
Permit EI Type:	Air Quality Registration
Status:	Active
Assigned Staff:	Amarello Susan
Affiliate Add1:	Not reported
Affiliate Add2:	Not reported
Affiliate City:	Not reported
Affiliate State:	Not reported
Affiliate Zip:	Not reported
Contact Add1:	Not reported
Contact City:	Not reported
Contact State:	Not reported
Contact Zip:	Not reported
Annual Fee:	No
OBS:	Not reported
Client No.:	Not reported
Town No.:	Not reported
Prem No.:	Not reported
Contact:	Not reported
Phone# Area Code:	Not reported
Mail Street:	Not reported
Mail Town:	Not reported
Mail State:	Not reported
Mail Zip:	Not reported
X Utm Grid:	Not reported
Y Utm Grid:	Not reported
Sic:	Not reported
Permit No:	110-0223-R
Description:	Not reported
Date Permit Issued:	01/01/1970
Date Permit Expires:	Not reported
Carbon Monoxide Emissions (TPY):	Not reported
Actual Pm10(TPY):	Not reported
Actual So(TPY):	Not reported
Actual Nox(TPY):	Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Actual Hc(TPY): Not reported  
Contact Title: Not reported  
Contact Email: Not reported  
Affiliation Type: Not reported  
Permit EI Type: Air Quality Registration  
Status: Active  
Assigned Staff: Amarello Susan  
Affiliate Add1: Not reported  
Affiliate Add2: Not reported  
Affiliate City: Not reported  
Affiliate State: Not reported  
Affiliate Zip: Not reported  
Contact Add1: Not reported  
Contact City: Not reported  
Contact State: Not reported  
Contact Zip: Not reported  
Annual Fee: No

**ENFORCEMENT:**

Enforcement Action ID: FNOVWRIN13103  
Enforcement Type Code: Field Notice of Violation  
Program Id: Not reported  
Enforcement Action Date: 04/04/2013  
Penalty Amount: \$0.00  
Sep Amt: Not reported  
Bureau Name: Materials Management & Compliance Assurance  
Program: Industrial Pre-Treatment Enforcement  
Status: Active  
Date of Discovery: 04/04/2013  
Resolution Date: Not reported  
Resolution Type: Not reported  
Staff: Gerke Chris  
ENF Action Comment: Not reported  
Number Violations: Not reported  
Civil Penalty: Not reported  
SEP Description: Not reported  
Associated EIs: Sewer Discharge (SP0000391)  
Client Affiliation Type: Respondent  
Affiliation Name: Not reported  
Affiliation Address Line1: Not reported  
Affiliation Address Line2: Not reported  
Affiliation City/State/Zip: Not reported  
Contact Title: Not reported  
Contact Name: JOHN HELENEK  
Contact EMail: Not reported

**NPDES:**

Town Id: 89  
Company Name: J.H. METAL FINISHING, INC.  
Permit Number: SP0000391  
Permit Issued Date: Not reported  
Permit Expiration Date: Not reported  
Application Received Date: 03/13/1999  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: J.H. METAL FINISHING, INC.  
Permit Number: SP0000391  
Permit Issued Date: 04/07/1982  
Permit Expiration Date: 04/07/1987  
Application Received Date: 01/01/1982  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: 89  
Company Name: J.H. METAL FINISHING, INC.  
Permit Number: SP0000391  
Permit Issued Date: 09/12/1994  
Permit Expiration Date: 09/12/1999  
Application Received Date: 05/06/1992  
Affiliation Type: Not reported  
Permit EI Type: Not reported  
App Id: Not reported  
Site Address Description: Not reported  
Site Address Line 2: Not reported  
Permit Description: Not reported  
Status: Not reported  
Affiliate Address Line 1: Not reported  
Affiliate Address Line 2: Not reported  
Affiliate City/State/Zip: Not reported  
Contact Name: Not reported  
Contact Title: Not reported  
Contact EMail: Not reported

Town Id: Not reported  
Company Name: Not reported  
Permit Number: SP0000391  
Permit Issued Date: 04/05/2012  
Permit Expiration Date: 04/04/2017  
Application Received Date: Not reported

Map ID  
 Direction  
 Distance  
 Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
 EPA ID Number

**JH METAL FINISHING, INC. (Continued)**

**S108306671**

Affiliation Type:	Permittee
Permit EI Type:	Sewer Discharge
App Id:	201005488
Site Address Description:	Not reported
Site Address Line 2:	Not reported
Permit Description:	Not reported
Status:	Continued
Affiliate Address Line 1:	1146 EAST ST
Affiliate Address Line 2:	Not reported
Affiliate City/State/Zip:	NEW BRITAIN, CT 06051-1619
Contact Name:	JOHN HELENEK
Contact Title:	Not reported
Contact EMail:	Not reported
Town Id:	Not reported
Company Name:	Not reported
Permit Number:	GS1002491
Permit Issued Date:	03/09/2012
Permit Expiration Date:	09/30/2018
Application Received Date:	Not reported
Affiliation Type:	Permittee
Permit EI Type:	Stormwater Industrial Activities - GP
App Id:	201107804
Site Address Description:	Not reported
Site Address Line 2:	Not reported
Permit Description:	JH Metal Finishing Inc.- 1146 East Street New Britain, Ct.
Status:	Active
Affiliate Address Line 1:	1146 EAST ST
Affiliate Address Line 2:	Not reported
Affiliate City/State/Zip:	NEW BRITAIN, CT 06051-1619
Contact Name:	JOHN HELENEK
Contact Title:	Not reported
Contact EMail:	jhmetal@sbcglobal.net

**E23**  
**SE**  
**1/4-1/2**  
**0.440 mi.**  
**2324 ft.**

**PAPAS DODGE**  
**ALLEN ST.**  
**NEW BRITAIN, CT 06051**  
**Site 3 of 3 in cluster E**

**CT CPCS** **S101406472**  
**N/A**

**Relative:**  
**Lower**

CPCS:	
Site Type:	LUST
Lust Status code:	4
Lust Status:	Lust Completed (DEP's significant hazard definition)
PTP Form:	Not reported
Program:	Not reported
Comments:	Ust Facility Notification No: 89-2477 According To The Ust Facility Notification Form Dated 9/16/98, 1x2k And 2x3k Gasoline Usts Were Removed From The Facility In 1988 By Hrp Associates Inc. Of New Britain Ct. Tanks Were Installed In September Of 1959
Site Type Definition:	Leaking Underground Storage Tanks Completed

**Actual:**  
**101 ft.**

Map ID  
 Direction  
 Distance  
 Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
 EPA ID Number

**24**  
**ENE**  
**1/4-1/2**  
**0.441 mi.**  
**2328 ft.**

**GRAYTON SCREW MACHINE**  
**1411 EAST STREET**  
**NEW BRITAIN, CT 060**

**CT SDADB** **S104254391**  
**CT PROPERTY** **N/A**  
**CT SPILLS**

**Relative:**  
**Lower**

Site Discovery and Assessment:

**Actual:**  
**97 ft.**

Facility ID:	3497
Rem Master ID:	3875
PTP Id:	Not reported
WPC Number:	Not reported
Postal District:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Lat/Long Determined By:	Not reported
Ground Water Quality Classification:	Not reported
Surface Water Quality Classification:	Not reported
Waste Type:	HYDRO/OIL, METALS, VOC
Disposal:	SPILL/DUMP, SPILL/DUMP, DRUMS
Sample Data Available:	False
Updated By:	DANYLUK, M.
Update Program:	D&A
Updated:	6/16/1999
Date Created:	Not reported
Duplicate:	False

SDA Federal:

EPA CERCLIS Id:	Not reported
Number EPA RCRIS Id:	Not reported
Site on EPA's CERCLIS:	Not reported
Site Archived from CERCLIS:	Not reported
Archive Date:	Not reported
EPA's Removal at Site:	Not reported
Deferred to another EPA Program:	Not reported
EPA Env Priority Initiative Site:	Not reported
Federal Facility:	Not reported
Site on EPA's National Priority List:	Not reported
Part of an NPL site:	Not reported
RCRA Generator Status:	Not reported
RCRA Permit Status:	Not reported

SDA Referral:

Referral Id:	3292
Source of referral:	SPILLS
Date Received:	5/27/1999
Staff Assigned:	Not reported
Remediation Program:	Not reported
Date dt_assigned:	Not reported
Remediation Complete Approved DEP/Verified by LEP:	8/20/1999
Outcome:	ON RECORD

SDA Remedial:

Remedial Id:	Not reported
PTP Id:	Not reported
Remediation Program:	Not reported
Remediation Program Entered:	Not reported
Staff Assigned:	Not reported
Remediation Program:	Not reported
Date dt_assign:	Not reported
Project Phase:	Not reported
Order issued:	Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GRAYTON SCREW MACHINE (Continued)**

**S104254391**

Order Number: Not reported  
Date order issued: Not reported  
Remedial Investigation Start: Not reported  
Remedial Investigation Completed: Not reported  
Remedial Design Start: Not reported  
Remedial Design complet: Not reported  
Remedial Action Start: Not reported  
Remedial Action Completed: Not reported  
Date Oper/ maintenance Started: Not reported  
GW monitoring: Not reported  
Remediation complete Approved DEP/Verified by LEP: Not reported

**SDA Orders:**

Order Id: Not reported  
Order Number: Not reported  
Date order issued: Not reported  
Staff Assigned: Not reported  
Type of Order: Not reported  
Order Respondent: Not reported  
Admin Appeal Date: Not reported  
Date of Admin Appeal Ruling: Not reported  
Date of Admin Appeal Ruling: Not reported  
Date of Final Order: Not reported  
Date of Court Appeal: Not reported  
Date of Court Ruling: Not reported  
Date of Court Ruling: Not reported  
Date Order Modified: Not reported  
Date Referred to AG: Not reported  
Judgement: Not reported  
Date of AGR judgement: Not reported  
Penalty assessed: Not reported  
Order Complete: Not reported  
In compliance: Not reported  
Comments: Not reported

**SDADB:**

**SDA Waste:**

Waste Id: 11  
Waste Type: HYDRO/OIL  
Description: Hydrocarbons and/or Fuel Oil

**CT Property:**

Seller Name: Webster Bank  
Buyer Name: 38-50 Main Street Association, LLC  
Certifying Party: Webster Bank  
Certifying Attention Person: Patricia DelGiorno  
Title Of Certifying Person: Vice President  
Certifying Person Address: 123 Broad Street  
Certifying Person City,St,Zip: New Britain, CT 06053  
Property Transfer Forms: Form I (DEP-PERD-PTP-201) when no release of hazardous waste has occurred at the parcel being transferred.  
Date Received: 01/24/2001  
Ackn Date: Not reported  
Determination Date: Not reported  
LEP Verified/DEP Approval Date: Not reported  
Rem Id: 4764

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GRAYTON SCREW MACHINE (Continued)**

**S104254391**

Remediation Location Id:	2835
Date Entered:	Not reported
Program:	Property Transfer Program
GAO Site:	False
Staff Full Name:	MaryAnne Danyluk
Super/Date:	Not reported
Stage Of Project:	Not reported
RP Level Of Activity:	Not reported
RP Needed Level Of Activity:	Not reported
Staff Level Of Activity:	Not reported
Staff Needed Level Of Activity:	Not reported
Public Intrest:	Not reported
PRP Cooperation:	Not reported
Enforcement Status:	Not reported
Level Of Complexity:	Not reported
Complex Eng Or Sci:	False
Complex Due To Public Involvement:	False
Politically Complex:	False
Complex Enforcement:	False
Coordination With Other Bureaus:	False
EPA Involvement:	False
Staff Prefrence:	Not reported
Readiness For Transfer:	Not reported
Project Transfer Time:	Not reported
Transfer Comments:	Not reported
Staff As Of July 2000:	Not reported
Initial Staff:	Not reported
Type Of Transfer:	unknown
Salutation:	Ms. DelGiorno
Relationship To Transfer:	transferor
Audit Date:	Not reported
Verif Type:	Not reported
Audit Outcome:	Not reported
GW:	Not reported
Basin:	Not reported
1st Payment:	200
Pay Tag1:	Not reported
2nd Payment:	Not reported
Pay Tag2:	Not reported
RTN:	02/09/2001
Revised:	Not reported
ECAF Received:	Not reported
Old Determination Date:	Not reported
Redeterminationdate:	Not reported
Previous Determination:	Not reported
Monitoringoption:	Not reported
Postremedialmonitoring:	Not reported
Schedule Of I/R:	Not reported
Schedule Overdue:	Not reported
Aprvl Sched:	Not reported
Yr 1 Report:	Not reported
Yr 2 Report:	Not reported
Report Overdue:	Not reported
Ext Aprvl Sched:	Not reported
License #:	Not reported
Project Phase:	Not reported
PT Comments:	Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GRAYTON SCREW MACHINE (Continued)**

**S104254391**

EPA Id Number: Not reported  
GW Class: Not reported  
SW Class: Not reported  
AO/C0: Not reported  
Water Lead(Y Or N): Not reported  
Priority: Not reported  
Project Status(A, I Or D): Not reported  
Last Updated: Not reported  
SR Comments: Not reported  
Priority Or Work-Load: Not reported  
Status: Not reported  
Notes: Not reported  
Special Project Name: Not reported  
Special Project Comments: Not reported  
DOT Project: Not reported  
Pt Counter: 0  
Project Complete: False  
Project Inactive: False  
Int Deposit #: Not reported  
Deposit #: Not reported  
Spill Case #: Not reported  
Diversion Id: Not reported  
Public Notice: Not reported  
RAP Received: Not reported  
RAP Approved: Not reported  
Compliance Category: Not reported  
Delete Record: False  
ECAF Reviewed By: Not reported  
Not Locatable: False  
Primary Address: True  
AKA Site Name: False  
Primary Site Name: True  
AKA Site Address: False  
Lead: Not reported

**SPILLS:**

Year of Database: 2007  
Case Number: 200702731  
Who Took Spill: 205  
Assigned To: 927  
Report Date: 05/03/2007  
Report Time: 10:54:02  
Date Release: 05/03/2007  
Time Responded: Not reported  
Reported By: sergio lupo  
Phone: 860 4162453  
Representing: New Britain health dept.  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: CLOSED  
Continuous Spill: False  
Released Substance: VARIOUS CHEMICALS & PETROLEUMS  
Qty: 0 (Gallons)  
Emergency Measure: Near Elmers Pizza and CCSU. Illegal junkyard with stream on property.  
Water Body: unknown  
Discharger: unknown

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**GRAYTON SCREW MACHINE (Continued)**

**S104254391**

Telephone: Not reported  
Responsible Party: Not reported  
RP Address 1: Not reported  
RP City,St,Zip: CT  
Historic: False  
Waterbody: False  
Time Stamp: 2015-09-08 09:34:16  
Sr Inspector: Cox, Michael  
At Inspctor: THIGPEN, DONNELL  
User Stamp: Granillom  
Comments: Not reported  
Action: Other  
Other Action: investigated  
Action: Investigated  
Other Action: Not reported  
Agency ID: DEP Dispatch  
Other Agency: Not reported  
DEP Bureau: Not reported  
DEP Agency: Not reported  
Cause ID: Dumping  
Other Cause: Not reported  
Media ID: Ground Surface  
Other Media: Not reported  
Class ID: Commercial  
Other Class: Not reported  
Release Type: petroleum  
Other Release: Not reported  
Release Type: chemical  
Other Release: Not reported  
Waterbody: Other  
Other Wtrbody: unknown

**25**  
**SW**  
**1/4-1/2**  
**0.500 mi.**  
**2639 ft.**

**FOOD BAG #505**  
**325 ALLEN STREET-335 ALLEN STREET**  
**NEW BRITAIN, CT 6053**

**CT LUST S104085178**  
**CT SPILLS N/A**  
**CT ENF**

**Relative:**  
**Higher**

LUST:  
LUST Id: 0  
UST Facility Id: 2914  
LUST Case Id: 60968  
Lust Status: Cleanup Initiated  
Processing Status: Not reported  
EPA Reportable: 0  
Motor Fuel: No  
Diesel: No  
Gasoline: No  
Other: No  
Other Release: Not reported  
No Release: No  
Leak: No  
Tank: Yes  
Piping: No  
Overfill: No  
Removal: Yes  
Incident Date: 10/01/2014  
Entry Date: 10/29/2015

**Actual:**  
**198 ft.**

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Site Case Id: 201404932  
UST Site Id: 0  
Cost Recovery Spill Case #: 0  
Old SITS Number: 0  
Case Log Id: 0  
Monthly Report Id: 0  
UST Owner Id: 2535  
LUST Owner Id: Not reported  
UST Event Id: 0  
Contact Info: Not reported  
Contact EMail: Not reported  
Site Contact City,St,Zip: UNKNOWN  
2nd Contact: Adam Duskocy (Ramboll Environ US Corporation)  
2nd Contact EMail: Not reported  
2nd Contact Address: 100 Pearl Street  
2nd Contact City,St,Zip: 64, CT 6103  
2nd Contact Address 2: Not reported  
2nd Contact City 2: Hartford  
2nd Contact Phone Number: 8608713123  
2nd Contact Fax Number: Not reported  
2nd Contact Type: Not reported  
Facility City Num: 89  
Site Contact: Not reported  
Site Contact Address: Not reported  
Site Contact Add 2: Not reported  
Site Contact City 2: Not reported  
Site Contact Phone: Not reported  
Site Contact Fax: Not reported  
Site Contact Type: Not reported  
Department Contact 1: Not reported  
Department Contact 2: Not reported  
Referral Source: Not reported  
Offsite Source: 0  
Date Referred: Not reported  
Emergency: No  
Private Heating Fuel: No  
Commercial Heating Fuel: No  
Commercial HF < 2100 Gal.: No  
Commercial HF > 2100 Gal.: No  
Commercial HF - Size Unk: No  
No LUST Site: No  
Cost Recvry Prgm Candidate: No  
OCSR Complete: No  
Follow Up Flag: No  
Alternate Water Supply: No  
Relocation: No  
Responsible Party: No  
Responsible EMail: Pbelanger@generalequities.com  
Resp Party Name: General Equities, Inc.  
Resp Party Address: 318 Main Street  
Resp Party City,St,Zip: Kensington, CT 60372637  
Resp Party Town Number: 7  
Resp Party Phone: 8608280333  
Resp Party Fax: 8608286963  
Resp Party Name 2: Peter Belanger (Operator)  
Resp Party Address 2: P.O. Box 7318  
Resp Party Phone 2: 8602500154



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Investigator Id: 0  
Follow Update: Not reported  
Area Lextent: Not reported  
Annual Precipitation: Not reported  
Affected Population: Not reported  
Population Setting: Not reported  
Ground Water Direction: Not reported  
Ground Water Gradient: Not reported  
Hydro Basin: Not reported  
Drastic: Not reported  
Geo Setting: Not reported  
Ground Water Classification: GB  
Receptor: Not reported  
Ground Water Flow Direction: Not reported  
Ground Water Depth: Not reported  
Areas Of Concern: Not reported  
Free Product Inches: 0  
Fund Date: Not reported  
Fund Planned: No  
Fund Obligated: No  
Fund Outlayed: No  
Fund Judgment: No  
Fund Recovered: No  
Cellar Borings: No  
Install Micro Wells: No  
Ground Water Sample: No  
Soil Sample: No  
Soil Gas: No  
Site Inspect: No  
Soil Excavate: No  
Geo Probe: No  
Survey: No  
Potable Well Sample: No  
Sample MWS: No  
Ground Water Gauging: No  
Soil Venting: No  
Active: Yes  
NOV Action: None  
NOV Issued: Not reported  
NOV Due: Not reported  
NOV Received: Not reported  
NOV Closed: Not reported  
NOV Disc Date: Not reported  
NOV Issued Date: Not reported  
NOV Compliance Sched: Not reported  
NOV Admin Order: Not reported  
NOV Referred To Ag: Not reported  
Stop All NOV Actions: No  
Release Invest Rpt: No  
DEP App Letter 1: No  
Correct Action Plan: No  
DEP App Letter 2: No  
Rem Sys Install: No  
Rem Sys Install Date: Not reported  
Closure Date: Not reported  
Rem Sys Monitoring Rpt: No  
Qrtly Gwater Mon Rpts: No

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Closure Req Rpt: No  
DEP Closure Letter: No  
Referred To: Not reported  
No Wells: 0  
Lph Wells: 0  
User Stamp: forresta/forresta  
Date Stamp: 07/18/2016  
Correspondence: Not reported  
Environmental Impact: Not reported  
FollowUp: Not reported  
GW Comments: Public water supply is available.  
Location Desc: Not reported  
NOV Comments: Not reported  
Release Desc: Not reported  
Running Comments: UST Enforcement Files (ICM) and Spills FilesOpen LUST Cases:2014-04932  
Work Performed: Not reported

**SPILLS:**

Year of Database: 2015  
Case Number: 201506495  
Who Took Spill: 209  
Assigned To: 0  
Report Date: 12/07/2015  
Report Time: 12:49:48  
Date Release: 12/07/2015  
Time Responded: Not reported  
Reported By: dispatch  
Phone: 860 8263000  
Representing: pd  
Terminated: YES  
Recovd (Total): 0  
Total (Water): 0  
Facility Status: CLOSED  
Continuous Spill: False  
Released Substance: GASOLINE  
Qty: 2 (Gallons)  
Emergency Measure: Not reported  
Water Body: Not reported  
Discharger: food bag  
Telephone: Not reported  
Responsible Party: Not reported  
RP Address 1: Not reported  
RP City,St,Zip: CT  
Historic: False  
Waterbody: False  
Time Stamp: 2015-12-10 10:30:56  
Sr Inspector: WELCH, THOMAS  
At Inspctor: \*\*NO RESPONSE  
User Stamp: Guzmanca  
Comments: Not reported  
Action: Sanded  
Other Action: Not reported  
Agency ID: DEP Dispatch  
Other Agency: Not reported  
DEP Bureau: Not reported  
DEP Agency: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Agency ID: LOCAL FIRE DEPARTMENT  
Other Agency: Not reported  
DEP Bureau: Not reported  
DEP Agency: Not reported  
Cause ID: Pump Failure  
Other Cause: Not reported  
Media ID: Ground Surface  
Other Media: Not reported  
Class ID: Commercial  
Other Class: Not reported  
Release Type: petroleum  
Other Release: Not reported

Year of Database: 1993  
Case Number: 663  
Who Took Spill: CIASULLO  
Assigned To: Not reported  
Report Date: 02/09/1993  
Report Time: 8  
Date Release: Not reported  
Time Responded: Not reported  
Reported By: DISP #4  
Phone: Not reported  
Representing: Not reported  
Terminated: Y  
Recovd (Total): .  
Total (Water): .  
Facility Status: Not reported  
Continuous Spill: Not reported  
Released Substance: Not reported  
Qty: 2 (Gallons)  
Emergency Measure: Not reported  
Water Body: Not reported  
Discharger: Not reported  
Telephone: Not reported  
Responsible Party: Not reported  
RP Address 1: Not reported  
RP City,St,Zip: Not reported  
Historic: Not reported  
Waterbody: Not reported  
Time Stamp: Not reported  
Sr Inspector: Not reported  
At Inspctor: Not reported  
User Stamp: Not reported  
Comments: Not reported

Year of Database: 1993  
Town of Spill: NEW BRITAIN  
Case Number: 663  
OCSR Inspector: NR  
Spill Date: 02/09/93  
Spill Time: 8: 40  
Report Date: 02/09/93  
Report Time: 8: 35  
Reported By: DISP 4  
Representing: NEW BRITAIN F D  
Work Telephone: 203- 826- 3000

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Home Telephone: Not reported  
Telephone Pole#: .  
Incident Type: PETROLEUM  
Substance: GASOLINE  
Quantity: 2 Gallon(s)  
Concentration: .  
Action Desc: Not reported  
On Going: Not reported  
Continuous Spill: Not reported  
Release Status: Terminated, Contained  
Misc Info: Not reported  
Water Body: Not reported  
Other Media: Not reported  
Release Area: Ground Surface  
Total (Water): .  
Recovd (Water): .  
Recovd (Total): .  
Polluter Name: CITGO  
Polluted Address: Not reported  
Polluted City,St,Zip: .  
Polluter Phone: .- .- .  
Polluter Responsibility: Polluter accepts financial responsibility  
Unknown Responsibility: Not reported  
Unknown Polluter: Not reported  
Cleanup Action: SANDED  
Dun and Bradst#: Not reported  
UST Unit: Not reported  
Agency Notified: DEP  
State Agency: Not reported  
Notify Date: 02/09/93  
Notify Time: 8: 55  
Other Agency: Not reported  
Notify Other: Not reported  
Notify Status: Not reported  
Class1: Commercial  
Other Class: Not reported  
Cause1: Motor Vehicle Accident  
Other Cause: Not reported  
Actions1: Contained/Removed  
Other Actions: Not reported  
Cleanup Contractor: Not reported  
Contractor Name: Not reported  
Did DEP Hire Contractor: Not reported  
Date Contractor Hired: .  
When Contractor Requested: Not reported  
When Contractor Arrived: Not reported  
Who Took Spill: CIASULLO  
Badge # of Who Recieved Spill: 912  
Who Assigned Spill: NR  
Badge # of Who Assigned Spill: .  
Date Assigned: .  
Assigned Time: Not reported  
Spill Status: Closed  
Case 1136: Not reported  
Federal 311K: .  
Case #1: Not reported  
Case #2: .

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**FOOD BAG #505 (Continued)**

**S104085178**

Cost Recovery: .  
Property Owner: Not reported  
Property Other: .  
Property Name: Not reported  
Property Addr: Not reported  
Property CSZ: .  
Polluter: Not reported  
Owner: Not reported  
Operator: Not reported  
Vehicle Make: Not reported  
Vehicle Model: Not reported  
Truck Reg: Not reported  
Trail Reg: Not reported  
Additional Info: Not reported  
Updated: Not reported  
Update Date: .

**ENFORCEMENT:**

Enforcement Action ID: NVAR17435--14225  
Enforcement Type Code: Notice Of Violation  
Program Id: Not reported  
Enforcement Action Date: 07/28/2014  
Penalty Amount: \$0.00  
Sep Amt: Not reported  
Bureau Name: Air Management  
Program: Air Enforcement  
Status: Active  
Date of Discovery: 07/02/2014  
Resolution Date: Not reported  
Resolution Type: Not reported  
Staff: Lumbroso Marco  
ENF Action Comment: Late Stage I testing.  
Number Violations: Not reported  
Civil Penalty: Not reported  
SEP Description: Not reported  
Associated EIs: Not reported  
Client Affiliation Type: Respondent  
Affiliation Name: GENERAL EQUITIES, INC.  
Affiliation Address Line1: PO BOX 7318  
Affiliation Address Line2: 318 MAIN STREET  
Affiliation City/State/Zip: KENSINGTON, CT 06037 7318  
Contact Title: Not reported  
Contact Name: Not reported  
Contact EMail: Not reported

26  
ENE  
1/2-1  
0.748 mi.  
3952 ft.

**NATIONAL WELDING AND MANUFACTURING  
690 CEDAR STREET  
NEWINGTON, CT**

**SEMS-ARCHIVE 1000259631  
CT SHWS CTD001155167  
CT SDADB  
CT BROWNFIELDS  
RCRA NonGen / NLR  
CT CPCS**

**Relative:  
Lower**

SEMS-ARCHIVE:  
Site ID: 101615  
EPA ID: CTD001155167  
Federal Facility: N  
NPL: Not on the NPL

**Actual:  
99 ft.**

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NATIONAL WELDING AND MANUFACTURING (Continued)**

**1000259631**

Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

**Following information was gathered from the prior CERCLIS update completed in 10/2013:**

Site ID: 0101615  
Federal Facility: Not a Federal Facility  
NPL Status: Not on the NPL  
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

CERCLIS-NFRAP Site Contact Details:

Contact Sequence ID: 1279477.00000  
Person ID: 1000151.00000

Contact Sequence ID: 13326475.00000  
Person ID: 13004278.00000

CERCLIS-NFRAP Assessment History:

Action: SITE INSPECTION  
Date Started: 08/10/94  
Date Completed: 11/01/95  
Priority Level: Low priority for further assessment

Action: SITE REASSESSMENT  
Date Started: / /  
Date Completed: 08/02/01  
Priority Level: Low priority for further assessment

Action: REMOVAL ASSESSMENT  
Date Started: 04/08/96  
Date Completed: 07/02/96  
Priority Level: Not reported

Action: NON-NATIONAL PRIORITIES LIST POTENTIALLY RESPONSIBLE PARTY SEARCH  
Date Started: 07/23/96  
Date Completed: 03/02/00  
Priority Level: Not reported

Action: SITE REASSESSMENT  
Date Started: 07/26/07  
Date Completed: 02/14/11  
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

Action: POTENTIALLY RESPONSIBLE PARTY REMOVAL  
Date Started: 09/01/97  
Date Completed: 03/16/99  
Priority Level: Cleaned up

Action: ARCHIVE SITE  
Date Started: / /  
Date Completed: 02/17/11  
Priority Level: Not reported

Action: PRELIMINARY ASSESSMENT  
Date Started: / /  
Date Completed: 08/18/88  
Priority Level: Higher priority for further assessment

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NATIONAL WELDING AND MANUFACTURING (Continued)**

**1000259631**

Action: COMFORT/STATUS LETTER  
Date Started: / /  
Date Completed: 07/18/05  
Priority Level: Not reported

Action: Public Notice Published  
Date Started: / /  
Date Completed: 03/19/98  
Priority Level: Not reported

Action: DISCOVERY  
Date Started: / /  
Date Completed: 04/21/88  
Priority Level: Not reported

**SHWS:**

State ID: 269  
PTP Id Number: Not reported  
WPC Number: Not reported  
EPA ID: CTD001155167  
PO Office: Not reported  
Lat/Long: 41.6944/-72.7553  
Location Method: UNK  
Groundwater Class: GA  
Surface Water Qualification: B  
Waste Category: CHLR VOC, SOLVENTS  
Disposal Method: WATER BODY  
Sample: False  
Other Dept of Env. Protection: RCRA  
Updated By: ZIMMERMAN, D.  
Update Program: FPRE  
Date Updated: 10/6/1995  
Duplicate: False  
Program: SUPERFUND  
Inventory Date: 7/6/1987  
On Inventory: True  
Assessed: True  
87 Group: EN  
87 Origin: INVENTORY  
On 87: True  
Comments: 1 DRUM/YR FOR 40 YRS. (7/87)

**Site Discovery and Assessment:**

Facility ID: 269  
Rem Master ID: 764  
PTP Id: Not reported  
WPC Number: Not reported  
Postal District: Not reported  
Latitude: 41.6944  
Longitude: -72.7553  
Lat/Long Determined By: UNK  
Ground Water Quality Classification: GA  
Surface Water Quality Classification: B  
Waste Type: CHLR VOC, SOLVENTS  
Disposal: WATER BODY  
Sample Data Available: False

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NATIONAL WELDING AND MANUFACTURING (Continued)**

**1000259631**

Updated By:	ZIMMERMAN, D.
Update Program:	FPRE
Updated:	10/6/1995
Date Created:	Not reported
Duplicate:	False
SDA Federal:	
EPA CERCLIS Id:	Not reported
Number EPA RCRIS Id:	Not reported
Site on EPA's CERCLIS:	True
Site Archived from CERCLIS:	False
Archive Date:	Not reported
EPA's Removal at Site:	False
Deferred to another EPA Program:	False
EPA Env Priority Initiative Site:	False
Federal Facility:	False
Site on EPA's National Priority List:	False
Part of an NPL site:	False
RCRA Generator Status:	Not reported
RCRA Permit Status:	Not reported
SDA Referral:	
Referral Id:	264
Source of referral:	SUPERFUND
Date Received:	7/6/1987
Staff Assigned:	DEP
Remediation Program:	SUPERFUND
Date dt_assigned:	7/6/1987
Remediation Complete Approved DEP/Verified by LEP:	7/6/1987
Outcome:	INVENTORY
SDA Remedial:	
Remedial Id:	Not reported
PTP Id:	Not reported
Remediation Program:	Not reported
Remediation Program Entered:	Not reported
Staff Assigned:	Not reported
Remediation Program:	Not reported
Date dt_assign:	Not reported
Project Phase:	Not reported
Order issued:	Not reported
Order Number:	Not reported
Date order issued:	Not reported
Remedial Investigation Start:	Not reported
Remedial Investigation Completed:	Not reported
Remedial Design Start:	Not reported
Remedial Design complet:	Not reported
Remedial Action Start:	Not reported
Remedial Action Completed:	Not reported
Date Oper/ maintenance Started:	Not reported
GW monitoring:	Not reported
Remediation complete Approved DEP/Verified by LEP:	Not reported
SDA Orders:	
Order Id:	Not reported
Order Number:	Not reported
Date order issued:	Not reported
Staff Assigned:	Not reported
Type of Order:	Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NATIONAL WELDING AND MANUFACTURING (Continued)**

**1000259631**

Order Respondent: Not reported  
Admin Appeal Date: Not reported  
Date of Admin Appeal Ruling: Not reported  
Date of Admin Appeal Ruling: Not reported  
Date of Final Order: Not reported  
Date of Court Appeal: Not reported  
Date of Court Ruling: Not reported  
Date of Court Ruling: Not reported  
Date Order Modified: Not reported  
Date Referred to AG: Not reported  
Judgement: Not reported  
Date of AGR judgement: Not reported  
Penalty assessed: Not reported  
Order Complete: Not reported  
In compliance: Not reported  
Comments: Not reported

**SDADB:**

**SDA Waste:**

Waste Id: 5  
Waste Type: CHLR VOC  
Description: Chlorinated Volatile Organic Compounds

**BROWNFIELDS 2:**

Region: 2  
Data Source CD: DECD  
Data Source: DECD Funded Brownfields Project

**RCRA NonGen / NLR:**

Date form received by agency: 07/10/1980  
Facility name: NATIONAL WELDING & MFG CO  
Facility address: 690 CEDAR ST  
NEWINGTON, CT 06111  
EPA ID: CTD001155167  
Mailing address: CEDAR ST  
NEWINGTON, CT 06111  
Contact: ENVR ENGINEER  
Contact address: 690 CEDAR ST  
NEWINGTON, CT 06111  
Contact country: US  
Contact telephone: (203) 555-1212  
Contact email: Not reported  
EPA Region: 01  
Classification: Non-Generator  
Description: Handler: Non-Generators do not presently generate hazardous waste

**Owner/Operator Summary:**

Owner/operator name: Not reported  
Owner/operator address: OWNERSTREET  
OWNERCITY, CT 99999  
Owner/operator country: Not reported  
Owner/operator telephone: (203) 555-1212  
Legal status: Private  
Owner/Operator Type: Owner  
Owner/Op start date: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**NATIONAL WELDING AND MANUFACTURING (Continued)**

**1000259631**

Owner/Op end date: Not reported

Handler Activities Summary:

U.S. importer of hazardous waste: No  
Mixed waste (haz. and radioactive): No  
Recycler of hazardous waste: No  
Transporter of hazardous waste: No  
Treater, storer or disposer of HW: No  
Underground injection activity: No  
On-site burner exemption: No  
Furnace exemption: No  
Used oil fuel burner: No  
Used oil processor: No  
User oil refiner: No  
Used oil fuel marketer to burner: No  
Used oil Specification marketer: No  
Used oil transfer facility: No  
Used oil transporter: No

Violation Status: No violations found

CPCS:

Site Type: Sites  
Lust Status code: Not reported  
Lust Status: Not reported  
PTP Form: Not reported  
Program: -1  
Comments: 1 Drum/yr For 40 Yrs. (7/87)  
Site Type Definition: Inventory of Hazardous Waste Disposal Sites

Site Type: LUST  
Lust Status code: 3  
Lust Status: Cleanup Initiated  
PTP Form: Not reported  
Program: Not reported  
Comments: Not reported  
Site Type Definition: Leaking Underground Storage Tanks Rem. Started

Count: 2 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HARTFORD	S110478846	FORMER GASOLINE STATION	INTERSECTION OF ZION STREET AN		CT LUST
HARTFORD	S104254075	KEENEY POND PUMP STATION	KEENEY PARK		CT SDADB

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

#### **NPL: National Priority List**

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/05/2017	Source: EPA
Date Data Arrived at EDR: 04/21/2017	Telephone: N/A
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 07/07/2017
Number of Days to Update: 21	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Quarterly

#### **NPL Site Boundaries**

##### **Sources:**

EPA's Environmental Photographic Interpretation Center (EPIC)  
Telephone: 202-564-7333

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

#### **Proposed NPL: Proposed National Priority List Sites**

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/05/2017	Source: EPA
Date Data Arrived at EDR: 04/21/2017	Telephone: N/A
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 07/07/2017
Number of Days to Update: 21	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Quarterly

#### **NPL LIENS: Federal Superfund Liens**

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***Federal Delisted NPL site list***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/05/2017	Source: EPA
Date Data Arrived at EDR: 04/21/2017	Telephone: N/A
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 07/07/2017
Number of Days to Update: 21	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Quarterly

## ***Federal CERCLIS list***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/05/2017	Telephone: 703-603-8704
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 07/07/2017
Number of Days to Update: 92	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/07/2017	Source: EPA
Date Data Arrived at EDR: 04/19/2017	Telephone: 800-424-9346
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/21/2017
Number of Days to Update: 16	Next Scheduled EDR Contact: 10/30/2017
	Data Release Frequency: Quarterly

## ***Federal CERCLIS NFRAP site list***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 02/07/2017	Source: EPA
Date Data Arrived at EDR: 04/19/2017	Telephone: 800-424-9346
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/28/2017
Number of Days to Update: 16	Next Scheduled EDR Contact: 10/30/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/12/2016	Source: EPA
Date Data Arrived at EDR: 12/28/2016	Telephone: 800-424-9346
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/28/2016	Telephone: (888) 372-7341
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/28/2016	Telephone: (888) 372-7341
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Quarterly

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/28/2016	Telephone: (888) 372-7341
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Quarterly

### RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/28/2016	Telephone: (888) 372-7341
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Varies

### ***Federal institutional controls / engineering controls registries***

#### LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/28/2016	Source: Department of the Navy
Date Data Arrived at EDR: 01/04/2017	Telephone: 843-820-7326
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 08/10/2017
Number of Days to Update: 93	Next Scheduled EDR Contact: 11/27/2017
	Data Release Frequency: Varies

#### US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/13/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/28/2017	Telephone: 703-603-0695
Date Made Active in Reports: 06/09/2017	Last EDR Contact: 05/31/2017
Number of Days to Update: 101	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Varies

#### US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/13/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/28/2017	Telephone: 703-603-0695
Date Made Active in Reports: 06/09/2017	Last EDR Contact: 05/31/2017
Number of Days to Update: 101	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **Federal ERNS list**

### ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/26/2016  
Date Data Arrived at EDR: 09/29/2016  
Date Made Active in Reports: 11/11/2016  
Number of Days to Update: 43

Source: National Response Center, United States Coast Guard  
Telephone: 202-267-2180  
Last EDR Contact: 06/28/2017  
Next Scheduled EDR Contact: 10/09/2017  
Data Release Frequency: Annually

## **State- and tribal - equivalent CERCLIS**

### SHWS: Inventory of Hazardous Disposal Sites

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 04/23/2010  
Date Data Arrived at EDR: 04/23/2010  
Date Made Active in Reports: 05/25/2010  
Number of Days to Update: 32

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3705  
Last EDR Contact: 06/29/2017  
Next Scheduled EDR Contact: 10/16/2017  
Data Release Frequency: No Update Planned

### SDADB: Site Discovery and Assessment Database

All sites reported to Permitting, Enforcement, and Remediation Division where it is suspected that hazardous waste may have been disposed or sites that are eligible for listing on the State Inventory of Hazardous Waste Disposal Sites.

Date of Government Version: 04/23/2010  
Date Data Arrived at EDR: 04/23/2010  
Date Made Active in Reports: 05/25/2010  
Number of Days to Update: 32

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3705  
Last EDR Contact: 06/29/2017  
Next Scheduled EDR Contact: 10/16/2017  
Data Release Frequency: No Update Planned

## **State and tribal landfill and/or solid waste disposal site lists**

### SWF/LF: List of Landfills/Transfer Stations

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/16/2016  
Date Data Arrived at EDR: 01/25/2017  
Date Made Active in Reports: 02/15/2017  
Number of Days to Update: 21

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3366  
Last EDR Contact: 07/28/2017  
Next Scheduled EDR Contact: 11/08/2017  
Data Release Frequency: Annually

## **State and tribal leaking storage tank lists**

### LUST: Leaking Underground Storage Tank List

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 01/25/2017  
Date Data Arrived at EDR: 01/31/2017  
Date Made Active in Reports: 04/05/2017  
Number of Days to Update: 64

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3376  
Last EDR Contact: 07/05/2017  
Next Scheduled EDR Contact: 10/16/2017  
Data Release Frequency: Semi-Annually



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/17/2016	Source: EPA Region 8
Date Data Arrived at EDR: 01/26/2017	Telephone: 303-312-6271
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

## INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/01/2016	Source: EPA Region 7
Date Data Arrived at EDR: 01/26/2017	Telephone: 913-551-7003
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/01/2016	Source: EPA Region 6
Date Data Arrived at EDR: 01/26/2017	Telephone: 214-665-6597
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2016	Source: EPA Region 4
Date Data Arrived at EDR: 01/27/2017	Telephone: 404-562-8677
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/28/2017
Number of Days to Update: 98	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Semi-Annually

## INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/07/2016	Source: EPA Region 10
Date Data Arrived at EDR: 01/26/2017	Telephone: 206-553-2857
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

## INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/14/2016	Source: EPA, Region 5
Date Data Arrived at EDR: 01/26/2017	Telephone: 312-886-7439
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/06/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/26/2017	Telephone: 415-972-3372
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land  
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 11/14/2016	Source: EPA Region 1
Date Data Arrived at EDR: 01/26/2017	Telephone: 617-918-1313
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## **State and tribal registered storage tank lists**

FEMA UST: Underground Storage Tank Listing  
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010	Source: FEMA
Date Data Arrived at EDR: 02/16/2010	Telephone: 202-646-5797
Date Made Active in Reports: 04/12/2010	Last EDR Contact: 07/14/2017
Number of Days to Update: 55	Next Scheduled EDR Contact: 10/23/2017
	Data Release Frequency: Varies

UST: Underground Storage Tank Data  
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/22/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 11/29/2016	Telephone: 860-424-3376
Date Made Active in Reports: 12/22/2016	Last EDR Contact: 06/21/2017
Number of Days to Update: 23	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Semi-Annually

AST: Marine Terminals and Tank Information  
A listing of bulk petroleum facilities that receive petroleum by a vessel.

Date of Government Version: 07/01/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 07/29/2016	Telephone: 860-424-3233
Date Made Active in Reports: 08/16/2016	Last EDR Contact: 06/29/2017
Number of Days to Update: 18	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land  
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/07/2016	Source: EPA Region 10
Date Data Arrived at EDR: 01/26/2017	Telephone: 206-553-2857
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land  
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 11/14/2016	Source: EPA, Region 1
Date Data Arrived at EDR: 01/26/2017	Telephone: 617-918-1313
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2016	Source: EPA Region 4
Date Data Arrived at EDR: 01/27/2017	Telephone: 404-562-9424
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/28/2017
Number of Days to Update: 98	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Semi-Annually

## INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/14/2017	Source: EPA Region 5
Date Data Arrived at EDR: 01/26/2017	Telephone: 312-886-6136
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/01/2016	Source: EPA Region 6
Date Data Arrived at EDR: 01/26/2017	Telephone: 214-665-7591
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Semi-Annually

## INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/01/2016	Source: EPA Region 7
Date Data Arrived at EDR: 01/26/2017	Telephone: 913-551-7003
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/17/2016	Source: EPA Region 8
Date Data Arrived at EDR: 01/26/2017	Telephone: 303-312-6137
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

## INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/06/2016	Source: EPA Region 9
Date Data Arrived at EDR: 01/26/2017	Telephone: 415-972-3368
Date Made Active in Reports: 05/05/2017	Last EDR Contact: 07/27/2017
Number of Days to Update: 99	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **State and tribal institutional control / engineering control registries**

### ENG CONTROLS: Engineering Controls Listing

An Engineered Control is a permanent physical structure designed to safely isolate pollutants which would otherwise not comply with the self-implementing remedial options allowed in the Connecticut Remediation Standard Regulations (RSRs). The ECGD includes a description of what is eligible to be considered as an Engineered Control under section 22a-133k-2(f)(2) of the RSRs, a description of the information necessary for the preparation of complete and approvable applications, a step-by-step outline of the review and approval process, and supplemental resources provided in the appendices.

Date of Government Version: 03/05/2013  
Date Data Arrived at EDR: 05/07/2013  
Date Made Active in Reports: 06/19/2013  
Number of Days to Update: 43

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3000  
Last EDR Contact: 08/03/2017  
Next Scheduled EDR Contact: 11/13/2017  
Data Release Frequency: Varies

### AUL: ELUR Sites

Environmental Land Use Restriction sites.

Date of Government Version: 11/09/2016  
Date Data Arrived at EDR: 11/10/2016  
Date Made Active in Reports: 12/19/2016  
Number of Days to Update: 39

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3912  
Last EDR Contact: 08/03/2017  
Next Scheduled EDR Contact: 11/20/2017  
Data Release Frequency: Varies

## **State and tribal voluntary cleanup sites**

### INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008  
Date Data Arrived at EDR: 04/22/2008  
Date Made Active in Reports: 05/19/2008  
Number of Days to Update: 27

Source: EPA, Region 7  
Telephone: 913-551-7365  
Last EDR Contact: 04/20/2009  
Next Scheduled EDR Contact: 07/20/2009  
Data Release Frequency: Varies

### INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015  
Date Data Arrived at EDR: 09/29/2015  
Date Made Active in Reports: 02/18/2016  
Number of Days to Update: 142

Source: EPA, Region 1  
Telephone: 617-918-1102  
Last EDR Contact: 06/27/2017  
Next Scheduled EDR Contact: 10/09/2017  
Data Release Frequency: Varies

### VCP: Voluntary Remediation Sites

Sites involved in the Voluntary Remediation Program.

Date of Government Version: 11/09/2016  
Date Data Arrived at EDR: 11/10/2016  
Date Made Active in Reports: 12/20/2016  
Number of Days to Update: 40

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3705  
Last EDR Contact: 08/03/2017  
Next Scheduled EDR Contact: 02/20/2047  
Data Release Frequency: Varies

## **State and tribal Brownfields sites**

### BROWNFIELDS 2: Brownfields Inventory

A brownfield site is generally defined as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant?]"

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/11/2016  
Date Data Arrived at EDR: 06/22/2016  
Date Made Active in Reports: 09/01/2016  
Number of Days to Update: 71

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3705  
Last EDR Contact: 06/23/2017  
Next Scheduled EDR Contact: 10/02/2017  
Data Release Frequency: Varies

## BROWNFIELDS: Brownfields Inventory

CBRA has identified over 200 brownfield sites eligible for redevelopment. In most cases these are prime properties for commercial or industrial use. CBRA's grants, assistance and financing lower the financial risks and eliminate the legal, regulatory and environmental risks of redevelopment.

Date of Government Version: 03/25/2016  
Date Data Arrived at EDR: 03/29/2016  
Date Made Active in Reports: 05/18/2016  
Number of Days to Update: 50

Source: Connecticut Brownfields Redevelopment Authority  
Telephone: 860-258-7833  
Last EDR Contact: 06/19/2017  
Next Scheduled EDR Contact: 10/02/2017  
Data Release Frequency: Varies

## ADDITIONAL ENVIRONMENTAL RECORDS

### **Local Brownfield lists**

#### US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/02/2017  
Date Data Arrived at EDR: 03/02/2017  
Date Made Active in Reports: 04/07/2017  
Number of Days to Update: 36

Source: Environmental Protection Agency  
Telephone: 202-566-2777  
Last EDR Contact: 06/20/2017  
Next Scheduled EDR Contact: 10/02/2017  
Data Release Frequency: Semi-Annually

### **Local Lists of Landfill / Solid Waste Disposal Sites**

#### SWRCY: Recycling Facilities

A listing of recycling facilities.

Date of Government Version: 12/15/2016  
Date Data Arrived at EDR: 12/20/2016  
Date Made Active in Reports: 02/10/2017  
Number of Days to Update: 52

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3223  
Last EDR Contact: 06/09/2017  
Next Scheduled EDR Contact: 09/25/2017  
Data Release Frequency: Varies

#### INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998  
Date Data Arrived at EDR: 12/03/2007  
Date Made Active in Reports: 01/24/2008  
Number of Days to Update: 52

Source: Environmental Protection Agency  
Telephone: 703-308-8245  
Last EDR Contact: 08/01/2017  
Next Scheduled EDR Contact: 11/13/2017  
Data Release Frequency: Varies

#### ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/30/1985  
Date Data Arrived at EDR: 08/09/2004  
Date Made Active in Reports: 09/17/2004  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: 800-424-9346  
Last EDR Contact: 06/09/2004  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009  
Date Data Arrived at EDR: 05/07/2009  
Date Made Active in Reports: 09/21/2009  
Number of Days to Update: 137

Source: EPA, Region 9  
Telephone: 415-947-4219  
Last EDR Contact: 07/24/2017  
Next Scheduled EDR Contact: 11/08/2017  
Data Release Frequency: No Update Planned

## IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014  
Date Data Arrived at EDR: 08/06/2014  
Date Made Active in Reports: 01/29/2015  
Number of Days to Update: 176

Source: Department of Health & Human Services, Indian Health Service  
Telephone: 301-443-1452  
Last EDR Contact: 08/10/2017  
Next Scheduled EDR Contact: 11/13/2017  
Data Release Frequency: Varies

## **Local Lists of Hazardous waste / Contaminated Sites**

### US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/09/2017  
Date Data Arrived at EDR: 03/08/2017  
Date Made Active in Reports: 06/09/2017  
Number of Days to Update: 93

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 02/28/2017  
Next Scheduled EDR Contact: 06/12/2017  
Data Release Frequency: No Update Planned

### CDL: Clandestine Drug Lab Listing

A listing of clandestine drug lab locations included in the Spills database.

Date of Government Version: 01/24/2017  
Date Data Arrived at EDR: 01/31/2017  
Date Made Active in Reports: 04/05/2017  
Number of Days to Update: 64

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3361  
Last EDR Contact: 07/05/2017  
Next Scheduled EDR Contact: 10/16/2017  
Data Release Frequency: Quarterly

### US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/09/2017  
Date Data Arrived at EDR: 03/08/2017  
Date Made Active in Reports: 06/09/2017  
Number of Days to Update: 93

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 05/31/2017  
Next Scheduled EDR Contact: 09/11/2017  
Data Release Frequency: Quarterly

## **Local Land Records**

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CT PROPERTY: Property Transfer Filings

A listing of sites that meet the definition of a hazardous waste establishment. They can be generators, dry cleaners, furniture strippers, etc. These sites have been sold to another owner.

Date of Government Version: 11/09/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 11/10/2016	Telephone: 860-424-3705
Date Made Active in Reports: 12/20/2016	Last EDR Contact: 08/03/2017
Number of Days to Update: 40	Next Scheduled EDR Contact: 11/20/2017
	Data Release Frequency: Semi-Annually

## LIENS: Environmental Liens Listing

A listing of environmental liens placed by the Cost Recovery Program.

Date of Government Version: 08/11/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 08/15/2016	Telephone: 860-424-3120
Date Made Active in Reports: 09/22/2016	Last EDR Contact: 08/10/2017
Number of Days to Update: 38	Next Scheduled EDR Contact: 11/27/2017
	Data Release Frequency: Varies

## LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/18/2014	Telephone: 202-564-6023
Date Made Active in Reports: 04/24/2014	Last EDR Contact: 07/26/2017
Number of Days to Update: 37	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## **Records of Emergency Release Reports**

### HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/28/2016	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 12/28/2016	Telephone: 202-366-4555
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 06/28/2017
Number of Days to Update: 37	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Annually

### SPILLS: Oil & Chemical Spill Database

Oil and Chemical Spill Data.

Date of Government Version: 01/24/2017	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 01/31/2017	Telephone: 860-424-3024
Date Made Active in Reports: 04/05/2017	Last EDR Contact: 07/05/2017
Number of Days to Update: 64	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Semi-Annually

### SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/15/2012	Source: FirstSearch
Date Data Arrived at EDR: 01/03/2013	Telephone: N/A
Date Made Active in Reports: 02/11/2013	Last EDR Contact: 01/03/2013
Number of Days to Update: 39	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **Other Ascertainable Records**

### **RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated**

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/28/2016	Telephone: (888) 372-7341
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 44	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Varies

### **FUDS: Formerly Used Defense Sites**

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015	Source: U.S. Army Corps of Engineers
Date Data Arrived at EDR: 07/08/2015	Telephone: 202-528-4285
Date Made Active in Reports: 10/13/2015	Last EDR Contact: 02/24/2017
Number of Days to Update: 97	Next Scheduled EDR Contact: 06/05/2017
	Data Release Frequency: Varies

### **DOD: Department of Defense Sites**

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005	Source: USGS
Date Data Arrived at EDR: 11/10/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 07/12/2017
Number of Days to Update: 62	Next Scheduled EDR Contact: 10/23/2017
	Data Release Frequency: Semi-Annually

### **FEDLAND: Federal and Indian Lands**

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005	Source: U.S. Geological Survey
Date Data Arrived at EDR: 02/06/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 07/14/2017
Number of Days to Update: 339	Next Scheduled EDR Contact: 10/23/2017
	Data Release Frequency: N/A

### **SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing**

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/03/2017	Telephone: 615-532-8599
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 08/18/2017
Number of Days to Update: 63	Next Scheduled EDR Contact: 11/27/2017
	Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 02/13/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/15/2017	Telephone: 202-566-1917
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Quarterly

## EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 08/07/2017
Number of Days to Update: 88	Next Scheduled EDR Contact: 11/20/2017
	Data Release Frequency: Quarterly

## 2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/03/2015	Telephone: 703-308-4044
Date Made Active in Reports: 03/09/2015	Last EDR Contact: 08/03/2017
Number of Days to Update: 6	Next Scheduled EDR Contact: 11/20/2017
	Data Release Frequency: Varies

## TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012	Source: EPA
Date Data Arrived at EDR: 01/15/2015	Telephone: 202-260-5521
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 06/21/2017
Number of Days to Update: 14	Next Scheduled EDR Contact: 10/02/2017
	Data Release Frequency: Every 4 Years

## TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2014	Source: EPA
Date Data Arrived at EDR: 11/24/2015	Telephone: 202-566-0250
Date Made Active in Reports: 04/05/2016	Last EDR Contact: 05/26/2017
Number of Days to Update: 133	Next Scheduled EDR Contact: 09/04/2017
	Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 07/28/2017
Number of Days to Update: 77	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Annually

## ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013	Source: EPA
Date Data Arrived at EDR: 12/12/2013	Telephone: 703-416-0223
Date Made Active in Reports: 02/24/2014	Last EDR Contact: 06/09/2017
Number of Days to Update: 74	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Annually

## RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/09/2017	Telephone: 202-564-8600
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 07/24/2017
Number of Days to Update: 57	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

## PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 10/17/2014	Telephone: 202-564-6023
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 08/08/2017
Number of Days to Update: 3	Next Scheduled EDR Contact: 11/20/2017
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 01/20/2016	Source: EPA
Date Data Arrived at EDR: 04/28/2016	Telephone: 202-566-0500
Date Made Active in Reports: 09/02/2016	Last EDR Contact: 04/10/2017
Number of Days to Update: 127	Next Scheduled EDR Contact: 07/24/2017
	Data Release Frequency: Annually

## ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/23/2016	Telephone: 202-564-2501
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 07/28/2017
Number of Days to Update: 79	Next Scheduled EDR Contact: 10/23/2017
	Data Release Frequency: Quarterly

## FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/18/2017
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/04/2017
	Data Release Frequency: Quarterly

## FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/18/2017
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/04/2017
	Data Release Frequency: Quarterly

## MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016	Source: Nuclear Regulatory Commission
Date Data Arrived at EDR: 09/08/2016	Telephone: 301-415-7169
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 08/01/2017
Number of Days to Update: 43	Next Scheduled EDR Contact: 11/20/2017
	Data Release Frequency: Quarterly

## COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005	Source: Department of Energy
Date Data Arrived at EDR: 08/07/2009	Telephone: 202-586-8719
Date Made Active in Reports: 10/22/2009	Last EDR Contact: 06/05/2017
Number of Days to Update: 76	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/10/2014	Telephone: N/A
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 06/05/2017
Number of Days to Update: 40	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Varies

## PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/19/2011	Telephone: 202-566-0517
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 07/28/2017
Number of Days to Update: 83	Next Scheduled EDR Contact: 11/08/2017
	Data Release Frequency: Varies

## RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/04/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/06/2017	Telephone: 202-343-9775
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 07/12/2017
Number of Days to Update: 35	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Quarterly

## HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

## HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2008
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

## DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/31/2012  
Date Data Arrived at EDR: 08/07/2012  
Date Made Active in Reports: 09/18/2012  
Number of Days to Update: 42

Source: Department of Transportation, Office of Pipeline Safety  
Telephone: 202-366-4595  
Last EDR Contact: 08/01/2017  
Next Scheduled EDR Contact: 11/13/2017  
Data Release Frequency: Varies

## CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2016  
Date Data Arrived at EDR: 11/18/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 77

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 06/21/2017  
Next Scheduled EDR Contact: 10/09/2017  
Data Release Frequency: Varies

## BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 02/24/2015  
Date Made Active in Reports: 09/30/2015  
Number of Days to Update: 218

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 05/26/2017  
Next Scheduled EDR Contact: 09/04/2017  
Data Release Frequency: Biennially

## INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 07/14/2015  
Date Made Active in Reports: 01/10/2017  
Number of Days to Update: 546

Source: USGS  
Telephone: 202-208-3710  
Last EDR Contact: 07/11/2017  
Next Scheduled EDR Contact: 10/23/2017  
Data Release Frequency: Semi-Annually

## FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016  
Date Data Arrived at EDR: 12/27/2016  
Date Made Active in Reports: 02/17/2017  
Number of Days to Update: 52

Source: Department of Energy  
Telephone: 202-586-3559  
Last EDR Contact: 08/03/2017  
Next Scheduled EDR Contact: 11/20/2017  
Data Release Frequency: Varies

## UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010  
Date Data Arrived at EDR: 10/07/2011  
Date Made Active in Reports: 03/01/2012  
Number of Days to Update: 146

Source: Department of Energy  
Telephone: 505-845-0011  
Last EDR Contact: 05/22/2017  
Next Scheduled EDR Contact: 09/04/2017  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/05/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/05/2017	Telephone: 703-603-8787
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 07/07/2017
Number of Days to Update: 36	Next Scheduled EDR Contact: 10/16/2017
	Data Release Frequency: Varies

## LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001	Source: American Journal of Public Health
Date Data Arrived at EDR: 10/27/2010	Telephone: 703-305-6451
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/02/2009
Number of Days to Update: 36	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

## US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016	Source: EPA
Date Data Arrived at EDR: 10/26/2016	Telephone: 202-564-2496
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 100	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Annually

## US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016	Source: EPA
Date Data Arrived at EDR: 10/26/2016	Telephone: 202-564-2496
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 08/11/2017
Number of Days to Update: 100	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Annually

## US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/08/2017	Source: Department of Labor, Mine Safety and Health Administration
Date Data Arrived at EDR: 02/28/2017	Telephone: 303-231-5959
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 05/31/2017
Number of Days to Update: 38	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Semi-Annually

## US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005	Source: USGS
Date Data Arrived at EDR: 02/29/2008	Telephone: 703-648-7709
Date Made Active in Reports: 04/18/2008	Last EDR Contact: 05/31/2017
Number of Days to Update: 49	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011	Source: USGS
Date Data Arrived at EDR: 06/08/2011	Telephone: 703-648-7709
Date Made Active in Reports: 09/13/2011	Last EDR Contact: 06/02/2017
Number of Days to Update: 97	Next Scheduled EDR Contact: 09/11/2017
	Data Release Frequency: Varies

## ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/14/2017	Source: Department of Interior
Date Data Arrived at EDR: 03/17/2017	Telephone: 202-208-2609
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 06/09/2017
Number of Days to Update: 21	Next Scheduled EDR Contact: 09/25/2017
	Data Release Frequency: Quarterly

## FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/04/2017	Source: EPA
Date Data Arrived at EDR: 04/07/2017	Telephone: (617) 918-1111
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 06/07/2017
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Quarterly

## ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 03/19/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2017	Telephone: 202-564-2280
Date Made Active in Reports: 05/12/2017	Last EDR Contact: 06/07/2017
Number of Days to Update: 52	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Quarterly

## UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015	Source: Department of Defense
Date Data Arrived at EDR: 01/29/2016	Telephone: 571-373-0407
Date Made Active in Reports: 04/05/2016	Last EDR Contact: 07/17/2017
Number of Days to Update: 67	Next Scheduled EDR Contact: 10/30/2017
	Data Release Frequency: Varies

## DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/02/2016  
Date Data Arrived at EDR: 06/03/2016  
Date Made Active in Reports: 09/02/2016  
Number of Days to Update: 91

Source: Environmental Protection Agency  
Telephone: 202-564-0527  
Last EDR Contact: 05/24/2017  
Next Scheduled EDR Contact: 09/11/2017  
Data Release Frequency: Varies

## FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/22/2017  
Date Data Arrived at EDR: 02/22/2017  
Date Made Active in Reports: 05/12/2017  
Number of Days to Update: 79

Source: EPA  
Telephone: 800-385-6164  
Last EDR Contact: 08/17/2017  
Next Scheduled EDR Contact: 12/04/2017  
Data Release Frequency: Quarterly

## AIRS: Permitted Air Sources Listing

A listing of permitted air sources in Connecticut.

Date of Government Version: 01/11/2017  
Date Data Arrived at EDR: 01/27/2017  
Date Made Active in Reports: 02/10/2017  
Number of Days to Update: 14

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3026  
Last EDR Contact: 07/21/2017  
Next Scheduled EDR Contact: 11/08/2017  
Data Release Frequency: Varies

## CPCS: Contaminated or Potentially Contaminated Sites

A list of Contaminated or Potentially Contaminated Sites within Connecticut. This list represents the "Hazardous Waste Facilities," as defined in Section 22a-134f of the Connecticut General Statutes (CGS). The list contains the following types of sites: Sites listed on the Inventory of Hazardous Waste Disposal Sites; Sites subject to the Property Transfer Act; Sites at which underground storage tanks are known to have leaked; Sites at which hazardous waste subject to the RCRA; Sites that are included in EPA's (CERCLIS); Sites that are the subject of an order issued by the Commissioner of DEP that requires investigation and remediation of a potential or known source of pollution; and Sites that have entered into one of the Department's Voluntary Remediation Programs.

Date of Government Version: 03/15/2017  
Date Data Arrived at EDR: 03/17/2017  
Date Made Active in Reports: 04/05/2017  
Number of Days to Update: 19

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3766  
Last EDR Contact: 08/03/2017  
Next Scheduled EDR Contact: 11/20/2017  
Data Release Frequency: Quarterly

## DRYCLEANERS: Drycleaner Facilities

A listing of drycleaner facility locations.

Date of Government Version: 07/18/2008  
Date Data Arrived at EDR: 08/08/2008  
Date Made Active in Reports: 08/27/2008  
Number of Days to Update: 19

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3026  
Last EDR Contact: 06/09/2017  
Next Scheduled EDR Contact: 09/25/2017  
Data Release Frequency: Varies

## ENFORCEMENT: Enforcement Case Listing

The types of enforcement actions included are administrative consent orders, final unilateral orders and final dispositions of civil cases through the Attorney General's Office.

Date of Government Version: 01/24/2017  
Date Data Arrived at EDR: 01/27/2017  
Date Made Active in Reports: 02/13/2017  
Number of Days to Update: 17

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3265  
Last EDR Contact: 07/13/2017  
Next Scheduled EDR Contact: 10/30/2017  
Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## Financial Assurance 1: Financial Assurance Information Listing

A listing containing RCRA financial assurance information submitted on behalf of the CT DEP's Program Analysis Group of the Waste Engineering and Enforcement Division.

Date of Government Version: 06/30/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 07/13/2016	Telephone: 860-418-5930
Date Made Active in Reports: 08/16/2016	Last EDR Contact: 06/29/2017
Number of Days to Update: 34	Next Scheduled EDR Contact: 10/02/2017
	Data Release Frequency: Varies

## Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 06/30/2016	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 07/13/2016	Telephone: 860-418-5930
Date Made Active in Reports: 08/16/2016	Last EDR Contact: 06/29/2017
Number of Days to Update: 34	Next Scheduled EDR Contact: 10/02/2017
	Data Release Frequency: Varies

## LEAD: Lead Inspection Database

The Lead Poisoning Prevention and Control Program lead inspection database.

Date of Government Version: 03/26/2014	Source: Department of Public Health
Date Data Arrived at EDR: 03/27/2014	Telephone: 860-509-7299
Date Made Active in Reports: 05/08/2014	Last EDR Contact: 06/16/2017
Number of Days to Update: 42	Next Scheduled EDR Contact: 09/18/2017
	Data Release Frequency: Varies

## LWDS: Connecticut Leachate and Wastewater Discharge Sites

The Leachate and Waste Water Discharge Inventory Data Layer (LWDS) includes point locations digitized from Leachate and Wastewater Discharge Source maps compiled by the Connecticut DEP. These maps locate surface and groundwater discharges that (1) have received a waste water discharge permit from the state or (2) are historic and now defunct waste sites or (3) are locations of accidental spills, leaks, or discharges of a variety of liquid or solid wastes.

Date of Government Version: 07/17/2009	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 10/21/2009	Telephone: N/A
Date Made Active in Reports: 10/30/2009	Last EDR Contact: 10/15/2014
Number of Days to Update: 9	Next Scheduled EDR Contact: 01/26/2015
	Data Release Frequency: Varies

## CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 08/19/2013	Telephone: 860-424-3375
Date Made Active in Reports: 10/03/2013	Last EDR Contact: 08/18/2017
Number of Days to Update: 45	Next Scheduled EDR Contact: 11/27/2017
	Data Release Frequency: No Update Planned

## NPDES: Wastewater Permit Listing

A listing of permits issued by the DEP.

Date of Government Version: 01/04/2017	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 01/10/2017	Telephone: 860-424-3832
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 07/24/2017
Number of Days to Update: 31	Next Scheduled EDR Contact: 10/09/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SEH: List of Significant Environmental Hazards Report to DEEP

The Significant Environmental Hazard Statute is intended to identify and abate short-term risks associated with specific environmental conditions identified in the statute. After abatement of short-term risks (meaning abatement of the significant environmental hazard condition), there may still be potential long-term risks associated with the release. However, a significant environmental hazard can be considered abated under the statute even though potential long-term risks may not have been addressed.

Date of Government Version: 09/30/2016  
Date Data Arrived at EDR: 10/26/2016  
Date Made Active in Reports: 12/20/2016  
Number of Days to Update: 55

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3766  
Last EDR Contact: 07/18/2017  
Next Scheduled EDR Contact: 10/30/2017  
Data Release Frequency: Varies

## EDR HIGH RISK HISTORICAL RECORDS

### *EDR Exclusive Records*

#### EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

#### EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

#### EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## EDR RECOVERED GOVERNMENT ARCHIVES

### ***Exclusive Recovered Govt. Archives***

#### RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Energy & Environmental Protection formerly know as the DEP which changes in July 2011 in Connecticut.

Date of Government Version: N/A	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 01/02/2014	Last EDR Contact: 06/01/2012
Number of Days to Update: 185	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

#### RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Energy & Environmental Protection formerly know as the DEP which changes in July 2011 in Connecticut.

Date of Government Version: N/A	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 01/02/2014	Last EDR Contact: 06/01/2012
Number of Days to Update: 185	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

#### NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016	Source: Department of Environmental Protection
Date Data Arrived at EDR: 04/11/2017	Telephone: N/A
Date Made Active in Reports: 07/27/2017	Last EDR Contact: 07/10/2017
Number of Days to Update: 107	Next Scheduled EDR Contact: 10/23/2017
	Data Release Frequency: Annually

#### NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/30/2017	Source: Department of Environmental Conservation
Date Data Arrived at EDR: 02/01/2017	Telephone: 518-402-8651
Date Made Active in Reports: 02/13/2017	Last EDR Contact: 08/03/2017
Number of Days to Update: 12	Next Scheduled EDR Contact: 11/13/2017
	Data Release Frequency: Annually

#### PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2015	Source: Department of Environmental Protection
Date Data Arrived at EDR: 07/22/2016	Telephone: 717-783-8990
Date Made Active in Reports: 11/22/2016	Last EDR Contact: 07/17/2017
Number of Days to Update: 123	Next Scheduled EDR Contact: 10/30/2017
	Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 06/19/2015  
Date Made Active in Reports: 07/15/2015  
Number of Days to Update: 26

Source: Department of Environmental Management  
Telephone: 401-222-2797  
Last EDR Contact: 05/22/2017  
Next Scheduled EDR Contact: 09/04/2017  
Data Release Frequency: Annually

## VT MANIFEST: Hazardous Waste Manifest Data

Hazardous waste manifest information.

Date of Government Version: 05/12/2017  
Date Data Arrived at EDR: 05/23/2017  
Date Made Active in Reports: 08/16/2017  
Number of Days to Update: 85

Source: Department of Environmental Conservation  
Telephone: 802-241-3443  
Last EDR Contact: 07/17/2017  
Next Scheduled EDR Contact: 10/30/2017  
Data Release Frequency: Annually

## WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016  
Date Data Arrived at EDR: 04/13/2017  
Date Made Active in Reports: 07/14/2017  
Number of Days to Update: 92

Source: Department of Natural Resources  
Telephone: N/A  
Last EDR Contact: 06/12/2017  
Next Scheduled EDR Contact: 09/25/2017  
Data Release Frequency: Annually

## Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

## Electric Power Transmission Line Data

Source: PennWell Corporation

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**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

## AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

## Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

## Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

## Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

### Daycare Centers: Licensed Child Care Facilities

Source: Department of Public Health

Telephone: 860-509-8045

**Flood Zone Data:** This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

### State Wetlands Data: Tidal Wetlands

Source: Department of Energy & Environmental Protection

Telephone: 860-424-4054

### Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey

### STREET AND ADDRESS INFORMATION

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## GEOCHECK<sup>®</sup> - PHYSICAL SETTING SOURCE ADDENDUM

### TARGET PROPERTY ADDRESS

PROPOSED PARKING GARAGE  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CT 06053

### TARGET PROPERTY COORDINATES

Latitude (North):	41.6882 - 41° 41' 17.52"
Longitude (West):	72.768698 - 72° 46' 7.31"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	685701.1
UTM Y (Meters):	4617351.0
Elevation:	162 ft. above sea level

### USGS TOPOGRAPHIC MAP

Target Property Map:	5642441 NEW BRITAIN, CT
Version Date:	2012

East Map:	5644952 HARTFORD SOUTH, CT
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

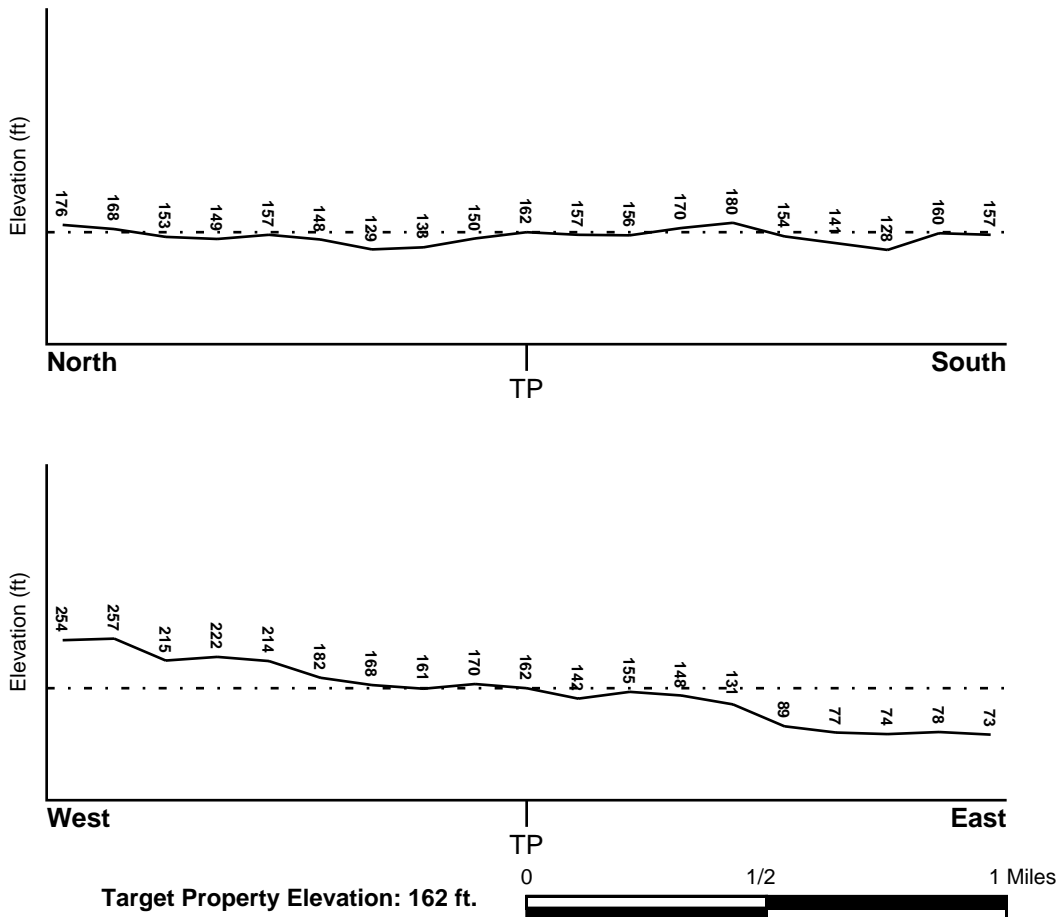
## TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

## TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General North

## SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

## FEMA FLOOD ZONE

<u>Flood Plain Panel at Target Property</u>	<u>FEMA Source Type</u>
09003C0484F	FEMA FIRM Flood data
<u>Additional Panels in search area:</u>	<u>FEMA Source Type</u>
09003C0483F	FEMA FIRM Flood data
09003C0503F	FEMA FIRM Flood data
09003C0491F	FEMA FIRM Flood data
09003C0511F	FEMA FIRM Flood data
09003C0492F	FEMA FIRM Flood data

## NATIONAL WETLAND INVENTORY

<u>NWI Quad at Target Property</u> NEW BRITAIN	<u>NWI Electronic Data Coverage</u> YES - refer to the Overview Map and Detail Map
---	---

## HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

### **Site-Specific Hydrogeological Data\*:**

Search Radius:	1.25 miles
Status:	Not found

## AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
1	1/8 - 1/4 Mile NNW	Not Reported
1G	1/8 - 1/4 Mile NNW	Not Reported

For additional site information, refer to Physical Setting Source Map Findings.



## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

### GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

#### **ROCK STRATIGRAPHIC UNIT**

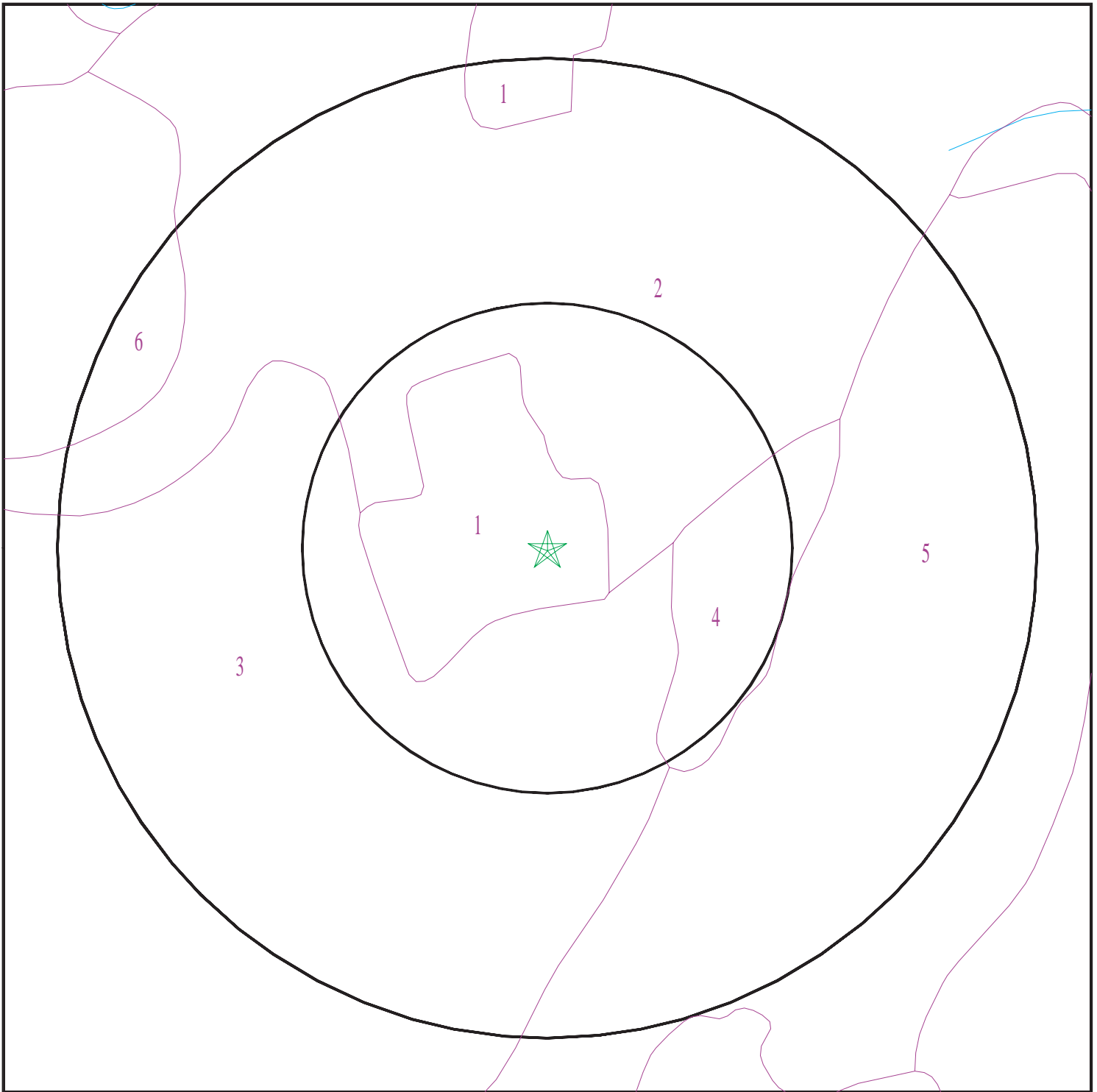
Era:	Mesozoic
System:	Triassic
Series:	Triassic
Code:	Tr ( <i>decoded above as Era, System &amp; Series</i> )

#### **GEOLOGIC AGE IDENTIFICATION**

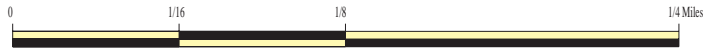
Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 5027979.2s



- ★ Target Property
- SSURGO Soil
- Water



SITE NAME: Proposed Parking Garage  
ADDRESS: 55 Paul Manafort Drive  
New Britain CT 06053  
LAT/LONG: 41.6882 / 72.768698

CLIENT: Leggette, Brashears & Graham  
CONTACT: Michael Susca  
INQUIRY #: 5027979.2s  
DATE: August 21, 2017 4:34 pm

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

### Soil Map ID: 1

Soil Component Name: Urban land

Soil Surface Texture: material

Hydrologic Group: Not reported

Soil Drainage Class:  
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	5 inches	material	Not reported	Not reported	Max: 141 Min: 0.07	Max: Min:

### Soil Map ID: 2

Soil Component Name: Udorthents

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	5 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 4.5
2	5 inches	21 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 703 Min: 0.01	Max: 7.8 Min: 4.5
3	21 inches	79 inches	very gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 703 Min: 0.01	Max: 7.8 Min: 4.5

### Soil Map ID: 3

Soil Component Name: Wethersfield

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	3 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
2	3 inches	12 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
3	12 inches	27 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
4	27 inches	64 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.4 Min: 0.01	Max: 7.8 Min: 5.1

### Soil Map ID: 4

Soil Component Name: Ludlow

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	7 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
2	7 inches	20 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
3	20 inches	25 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 4.5
4	25 inches	64 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.01	Max: 6 Min: 4.5

### Soil Map ID: 5

Soil Component Name: Yalesville

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 92 inches

Depth to Watertable Min: > 0 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	7 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 4	Max: 6 Min: 4.5
2	7 inches	14 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 4	Max: 6 Min: 4.5
3	14 inches	25 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 4	Max: 6 Min: 4.5
4	25 inches	36 inches	gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6 Min: 4.5
5	36 inches	46 inches	unweathered bedrock	Not reported	Not reported	Max: 141 Min: 0.07	Max: Min:

### Soil Map ID: 6

Soil Component Name: Manchester

Soil Surface Texture: gravelly sandy loam

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	9 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5
2	9 inches	18 inches	gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 703 Min: 42	Max: 6 Min: 4.5
3	18 inches	64 inches	stratified extremely gravelly coarse sand to very gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 703 Min: 42	Max: 6 Min: 4.5

### LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

### WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

### FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>



# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
2	USGS40000227931	1/2 - 1 Mile West
3	USGS40000228015	1/2 - 1 Mile NNE

## FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No PWS System Found		













Note: PWS System location is not always the same as well location.

## STATE DATABASE WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No Wells Found		

# PHYSICAL SETTING SOURCE MAP - 5027979.2s



-  County Boundary
-  Major Roads
-  Contour Lines
-  Earthquake epicenter, Richter 5 or greater
-  Water Wells
-  Public Water Supply Wells
-  Cluster of Multiple Icons
-  Groundwater Flow Direction
-  Indeterminate Groundwater Flow at Location
-  Groundwater Flow Varies at Location
-  Closest Hydrogeological Data
-  EPA Designated Sole Src. Aq.

SITE NAME: Proposed Parking Garage  
 ADDRESS: 55 Paul Manafort Drive  
 New Britain CT 06053  
 LAT/LONG: 41.6882 / 72.768698

CLIENT: Leggette, Brashears & Graham  
 CONTACT: Michael Susca  
 INQUIRY #: 5027979.2s  
 DATE: August 21, 2017 4:34 pm

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Elevation

Database      EDR ID Number

<b>1</b>	Site ID:	89-9100	
<b>NNW</b>	Groundwater Flow:	Not Reported	<b>AQUIFLOW      22688</b>
<b>1/8 - 1/4 Mile</b>	Shallow Water Depth:	Not Reported	
<b>Higher</b>	Deep Water Depth:	10	
	Average Water Depth:	Not Reported	
	Date:	10/17/1997	

<b>2</b>			
<b>West</b>			<b>FED USGS      USGS40000227931</b>
<b>1/2 - 1 Mile</b>			
<b>Higher</b>			

Org. Identifier:	USGS-CT		
Formal name:	USGS Connecticut Water Science Center		
Monloc Identifier:	USGS-414125072471101		
Monloc name:	CT-NB 3		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	01080205	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6903773
Longitude:	-72.7859308	Sourcemap scale:	Not Reported
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	315.00
Vert measure units:	feet	Vertacc measure val:	5.
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Early Mesozoic basin aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1916	Welldepth:	89
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

	Feet below	Feet to
Date	Surface	Sealevel
-----		
1916-08-01	30.00	

<b>3</b>			
<b>NNE</b>			<b>FED USGS      USGS40000228015</b>
<b>1/2 - 1 Mile</b>			
<b>Lower</b>			

Org. Identifier:	USGS-CT		
Formal name:	USGS Connecticut Water Science Center		
Monloc Identifier:	USGS-414206072454601		
Monloc name:	CT-NB 212		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	01080205	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.7017666
Longitude:	-72.7623188	Sourcemap scale:	24000

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	145
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Sand and gravel aquifers (glaciated regions)		
Formation type:	Drift, Stratified		
Aquifer type:	Unconfined single aquifer		
Construction date:	19890207	Welldepth:	10.75
Welldepth units:	ft	Wellholedepth:	19
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----		
1989-08-24	3.04	

**1G  
NNW  
1/8 - 1/4 Mile  
Lower**

Site ID:	89-9100
Groundwater Flow:	Not Reported
Shallow Water Depth:	Not Reported
Deep Water Depth:	10
Average Water Depth:	Not Reported
Date:	10/17/1997

**AQUIFLOW    22688**

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

## AREA RADON INFORMATION

State Database: CT Radon

### Radon Test Results

City	# Sites	< 4 Pci/L	4 < 10 Pci/L	10 < 20 Pci/L	20 < 50 Pci/L	50 < 100 Pci/L	> 100 Pci/L
Southington	27	12 (44.4)	11 (40.7)	4 (14.8)	0 (0)	0 (0)	0 (0)
Suffield	12	10 (83.3)	2 (16.7)	0 (0)	0 (0)	0 (0)	0 (0)
Unionville	5	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Weatogue	6	6 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
West Hartford	55	46 (83.6)	7 (12.7)	1 (1.8)	1 (1.8)	0 (0)	0 (0)
West Simsbury	13	12 (92.3)	1 (7.7)	0 (0)	0 (0)	0 (0)	0 (0)
West Suffield	5	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Wethersfield	33	27 (81.8)	5 (15.2)	1 (3)	0 (0)	0 (0)	0 (0)
Windsor	19	15 (78.9)	4 (21.1)	0 (0)	0 (0)	0 (0)	0 (0)
Windsor Locks	8	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Tariffville	2	1 (50)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)
East Hampton	110	83 (100)	19 (0)	8 (0)	0 (0)	0 (0)	0 (0)
Manchester	34	24 (70.6)	10 (29.4)	0 (0)	0 (0)	0 (0)	0 (0)
Avon	15	8 (53.3)	6 (50)	1 (6.7)	0 (0)	0 (0)	0 (0)
Berlin	11	7 (63.6)	1 (9.1)	4 (36.4)	0 (0)	0 (0)	0 (0)
Bloomfield	7	7 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Bristol	17	10 (58.8)	4 (23.5)	3 (17.6)	0 (0)	0 (0)	0 (0)
Broad Brook	3	1 (33.3)	2 (66.7)	0 (0)	0 (0)	0 (0)	0 (0)
Burlington	125	125 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Canton	8	6 (75)	2 (25)	0 (0)	0 (0)	0 (0)	0 (0)
Collinsville	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)
East Berlin	6	4 (66.7)	2 (33.3)	0 (0)	0 (0)	0 (0)	0 (0)
East Granby	13	8 (61.5)	0 (0)	1 (7.7)	0 (0)	4 (30.8)	0 (0)
East Hartford	20	20 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
East Hartland	1	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
East Windsor	4	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	0 (0)
Enfield	2	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Farmington	34	31 (91.2)	1 (2.9)	0 (5.9)	2 (0)	0 (0)	0 (0)
Forestville	3	3 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Glastonbury	152	120 (78.9)	22 (14.5)	5 (3.3)	4 (2.6)	0 (0)	1 (.7)
Granby	10	8 (80)	2 (20)	0 (0)	0 (0)	0 (0)	0 (0)
Hartford	99	95 (96)	5 (4)	0 (0)	0 (0)	0 (0)	0 (0)
Kensington	7	6 (85.7)	1 (14.3)	0 (0)	0 (0)	0 (0)	0 (0)
Marion	1	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Marlborough	16	12 (75)	4 (25)	0 (0)	0 (0)	0 (0)	0 (0)
New Britain	20	13 (65)	5 (25)	2 (10)	0 (0)	0 (0)	0 (0)
Newington	45	26 (57.8)	12 (26.7)	6 (13.3)	1 (2.2)	0 (0)	0 (0)
North Canton	2	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Plainville	2	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Plantsville	3	3 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Rocky Hill	24	19 (79.2)	3 (12.5)	2 (8.3)	0 (0)	0 (0)	0 (0)
Simsbury	13	12 (92.3)	1 (7.7)	0 (0)	0 (0)	0 (0)	0 (0)
South Glastonbury	13	10 (76.9)	0 (0)	1 (7.7)	1 (7.7)	0 (0)	1 (7.7)
South Windsor	23	23 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

## AREA RADON INFORMATION

Federal EPA Radon Zone for HARTFORD County: 3

- Note: Zone 1 indoor average level > 4 pCi/L.  
 : Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.  
 : Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 06053

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.100 pCi/L	100%	0%	0%

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

### USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

### Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

### State Wetlands Data: Tidal Wetlands

Source: Department of Energy & Environmental Protection

Telephone: 860-424-4054

## HYDROGEOLOGIC INFORMATION

### AQUIFLOW<sup>R</sup> Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

### Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

### STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

### SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

### FEDERAL WATER WELLS

#### PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

#### PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

#### USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

### STATE RECORDS

#### Connecticut Leachate and Wastewater Discharge Sites

Source: Department of Environmental Protection

The Leachate and Waste Water Discharge Inventory Data Layer (LWDS) includes point locations digitized from Leachate and Wastewater Discharge Source maps compiled by the Connecticut DEP. These maps locate surface and groundwater discharges that (1) have received a waste water discharge permit from the state or (2) are historic and now defunct waste sites or (3) are locations of accidental spills, leaks, or discharges of a variety of liquid or solid wastes.

#### EPA-Approved Sole Source Aquifers in Connecticut

Source: EPA

Sole source aquifers are defined as an aquifer designated as the sole or principal source of drinking water for a given aquifer service area; that is, an aquifer which is needed to supply 50% or more of the drinking water for the area and for which there are no reasonable alternative sources should the aquifer become contaminated.

#### Community and Non-Community Water System Wells

Source: Department of Public Health, Water Supplies Section

Telephone: 860-509-7333

Active, emergency and inactive wells used for potable purposes that are owned and operated by active community and non-community water systems in Connecticut.

## OTHER STATE DATABASE INFORMATION

### RADON

#### State Database: CT Radon

Source: Department of Public Health

Telephone: 860-509-7367

Radon Statistical Summary

#### Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.



## PHYSICAL SETTING SOURCE RECORDS SEARCHED

### EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

### OTHER

Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

### STREET AND ADDRESS INFORMATION

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**APPENDIX VII**

**CTDEEP SPILL REPORTS**



Connecticut Department of Energy and Environmental Protection  
Emergency Response and Spill Prevention Division  
Emergency Incident Report

Case No.: 99-07242

Staff Receiving Call: 203 SUSAN CAMPBELL

Assigned To: 000 NO RESPONSE

Date Reported: 10/24/1999 Time Reported: 14:00

Date of Release: 10/24/1999 Time of Release: 14:00

Town of Release: NEW BRITAIN

State of Release: CT

Location of Reported Release: 1517 STANLEY RD

Reported By: #813

Phone: (860) 826-3000

Ext:

Representing: NEW BRITAIN FD

Responsible Party:

Phone:

Street Address:

Town:

State:

Zip Code:

Does the Responsible Party Accept Financial Responsibility?

Release Type: PETROLEUM

CHEMICAL

Release Substance: MOTOR VEHICLE FLUIDS

Media: GROUND SURFACE

Total Quantity: <1 Gallons 0 Cubic Yards 0 Cubic Feet 0 Drums 0 Pounds

Emergency Measures: SPEEDY DRY

Has the Release Been Terminated?: YES

Type of Waterbody Affected: NONE

Name of Waterbody Affected:

Total Quantity Recovered: 0

Total Quantity in Water: 0

Corrective Actions Taken: SANDED

CLEANED

Discharge Class: TRANSPORTATION

Cause of Incident: MV ACCIDENT

Agencies Notified: DEP DISPATCH

LOCAL FIRE DEPARTMENT

Status: CLOSED



**Connecticut Department of Energy and Environmental Protection**  
**Emergency Response and Spill Prevention Division**  
**Emergency Incident Report**

Case No.: 2001-09187

Staff Receiving Call: 212 JOHNSTON, ALEXANDER Assigned To: 000 NO RESPONSE

Date Reported: 11/02/2001 Time Reported: 19:36

Date of Release: 11/02/2001 Time of Release: UNKNOWN

Town of Release: NEW BRITAIN State of Release: CT

Location of Reported Release: INTER. OF FRANCIS AND STANLEY STREETS

Reported By: DISPATCHER 827 Phone: (860) 826-3000 Ext:

Representing: SELF

Responsible Party: Phone:

Street Address:

Town: State: Zip Code:

Does the Responsible Party Accept Financial Responsibility?

Release Type: CHEMICAL

Release Substance: ANTIFREEZE

Media: GROUND SURFACE

Total Quantity: 1 Gallons 0 Cubic Yards 0 Cubic Feet 0 Drums 0 Pounds

Emergency Measures: fd sanded

Has the Release Been Terminated?: YES

Type of Waterbody Affected:

Name of Waterbody Affected:

Total Quantity Recovered: 0 Total Quantity in Water: 0

Corrective Actions Taken: SANDED

Discharge Class: PRIVATE

Cause of Incident: MV ACCIDENT

Agencies Notified: DEP DISPATCH  
LOCAL FIRE DEPARTMENT

Status: CLOSED



**Connecticut Department of Energy and Environmental Protection**  
**Emergency Response and Spill Prevention Division**  
**Emergency Incident Report**

Case No.: 2010-07477

Staff Receiving Call: 202 LANDRY, ROBIN

Assigned To: 000 NO RESPONSE

Date Reported: 12/15/2010 Time Reported: 23:22

Date of Release: 12/15/2010 Time of Release: UNKNOWN

Town of Release: NEW BRITAIN State of Release: CT

Location of Reported Release: 1537 STANLEY STREET

Reported By: CAMPANELLA Phone: (860) 826-3000 Ext:

Representing: FD

Responsible Party: Phone:

Street Address:

Town: State: Zip Code:

Does the Responsible Party Accept Financial Responsibility?

Release Type: PETROLEUM

Release Substance: GASOLINE

Media: GROUND SURFACE

Total Quantity: ~1 Gallons 0 Cubic Yards 0 Cubic Feet 0 Drums 0 Pounds

Emergency Measures:

Has the Release Been Terminated?: YES

Type of Waterbody Affected: NONE

Name of Waterbody Affected:

Total Quantity Recovered: 0 Total Quantity in Water: 0

Corrective Actions Taken: SANDED

Discharge Class: TRANSPORTATION PRIVATE

Cause of Incident: HOSE FAILURE

Agencies Notified: DEP DISPATCH  
LOCAL FIRE DEPARTMENT

Status: CLOSED



Connecticut Department of Energy and Environmental Protection  
Emergency Response and Spill Prevention Division  
Emergency Incident Report

Case No.: 2015-05580

Staff Receiving Call: 214 WREN, MICHAEL

Assigned To: 000 NO RESPONSE

Date Reported: 10/22/2015 Time Reported: 18:31

Date of Release: 10/22/2015 Time of Release: 18:11

Town of Release: NEW BRITAIN

State of Release: CT

Location of Reported Release: STRATFORD RD AND STANLEY ST

Reported By: DISP DIXON

Phone: (860) 826-3000

Ext:

Representing: FD

Responsible Party:

Phone:

Street Address:

Town:

State:

Zip Code:

Does the Responsible Party Accept Financial Responsibility?

Release Type: CHEMICAL

Release Substance: ANTIFREEZE

Media: GROUND SURFACE

Total Quantity: 1 Gallons 0 Cubic Yards 0 Cubic Feet 0 Drums 0 Pounds

Emergency Measures: FD responded. Sanded

Has the Release Been Terminated?: YES

Type of Waterbody Affected:

Name of Waterbody Affected: NONE

Total Quantity Recovered: 0

Total Quantity in Water: 0

Corrective Actions Taken: SANDED

Discharge Class: PRIVATE

Cause of Incident: MV ACCIDENT

Agencies Notified: LOCAL POLICE

DEP DISPATCH

LOCAL FIRE DEPARTMENT

Status: CLOSED

**APPENDIX VIII**

**SITE PHOTOGRAPHS**



**Photo 1: Parking area, looking northeast**



**Photo 3: Charter Oak State College building, front**



**Photo 2: Parking area, looking west**



**Photo 4: Charter Oak State College building, rear**





**Photo 5: Transformer, looking northwest**



**Photo 7: Stand-by generator within enclosure**



**Photo 6: Transformer showing non-PCB label**



**Photo 8: View of rear of commercial buildings to west, looking southwest across Site parking lot**



**Photo 9: View of commercial buildings to west**



**Photo 11: View of CCSU campus buildings, looking east along Paul Manafort Drive**



**Photo 9: View of construction on CCSU campus, looking northwest along Paul Manafort Drive**



**Photo 12: View of Stratford Street, looking west; note possible pole-mounted transformer**

**APPENDIX IX**

**QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS**



Bill Beckman has extensive experience in projects involving the development, use, storage, management and treatment of water. His experience includes the planning, development, design and permitting for new potable water supply systems and upgrades to existing systems. His experience also includes evaluation and management of water resources such as watershed and runoff determinations, stormwater controls and management, and design, assessment and maintenance of ponds. He is also experienced in flow routing, dam design, inspection and repairs, flood stage determination, and flood assessment and analysis. He has completed projects for environmental management and permitting, such as stormwater management, water supply and diversion, and spill protection. Mr. Beckman is also experienced in the design of potable water-supply systems, including wells, transmission mains, pump houses and water treatment processes. He has considerable experience in planning and directing environmental site assessments for real estate transactions. His work has included investigation and assessment of subsurface contamination, and design of groundwater and soil remediation systems, including those that remove volatile organic compounds, petroleum hydrocarbons and heavy metals. Mr. Beckman has also developed, constructed and analyzed many 2-D solute transport and 3-D groundwater flow models in hydrogeologic evaluations involving both groundwater supply and groundwater contamination.

Mr. Beckman's field and data analysis experience includes: collection of geophysical data from earth resistivity, seismic and gravity surveys; inspections to assess watershed characteristics; supervision of drilling, well development and aquifer testing programs; inspection of dams; interpretation of geophysical borehole logging data; directing well maintenance programs including well-loss studies; directing regional water budget analysis; and construction supervision of water-supply, water treatment, and soil and groundwater remedial systems. He has managed remedial investigations (RI), conducted feasibility studies (FS) and supervised remedial design at several CERCLA sites. Mr. Beckman has provided expert witness testimony, represented clients before local, state and federal agencies, and provided second opinion review services.

## **EDUCATION**

M.S. in Civil and Environmental Engineering, 1978, University of Rhode Island, Kingston, Rhode Island

B.S. in Civil and Environmental Engineering, 1976, University of Rhode Island, Kingston, Rhode Island

## **REGISTRATION**

Registered Professional Engineer in the states of Alabama, Connecticut, Delaware, Florida, Illinois, Kansas, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina and Wisconsin

Licensed Environmental Professional in the State of Connecticut.

## **TECHNICAL SOCIETIES**

American Society of Civil Engineers

Environmental Professional's Organization of Connecticut

## **SUMMARY OF PROFESSIONAL EXPERIENCE**

### **2008 to present:**

Senior Vice President and Director of Leggette, Brashears & Graham, Inc., Shelton, Connecticut

### **1991 to 2008:**

Vice President and Director of Leggette, Brashears & Graham, Inc., Wilton, Trumbull and Shelton, Connecticut

### **1987 to 1991:**

Senior Associate with Leggette, Brashears & Graham, Inc., Wilton, Connecticut

### **1985 to 1987:**

Associate with Leggette, Brashears & Graham, Inc., Wilton, Connecticut

### **1981 to 1984:**

Senior Hydrologist with Leggette, Brashears & Graham, Inc., Wilton, Connecticut

### **1978 to 1980:**

Hydrologist with Leggette, Brashears & Graham, Inc., Westport and Wilton, Connecticut

### **1976 to 1978:**

Research Assistant, Civil Engineering Department, University of Rhode Island

## **SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT**

### **Bloomfield, Connecticut**

Evaluation of an office park water supply consisting of eight high-yield bedrock wells. Recommendations were made for improved yield and well operation and an estimate developed for total safe yield of the system.

### **Brandenburg, Kentucky**

Siting an industrial water-supply well to develop the required yield while avoiding the capture of nearby organic contamination in the aquifer.

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**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Creswell, North Carolina**

Computer model analysis of the effects of a proposed peat harvesting operation on a five-layer aquifer system in a Coastal Plain environment. A three-dimensional model was used to simulate dewatering for removal of the surficial peat layer and the operation of several deep supply wells, to allow for the evaluation of regional and local changes in heads and flows and the estimation of ground-water inflow.

**Fairfield County, Connecticut**

Hydrogeologic evaluation to determine groundwater yields and environmental impacts of small water supplies for numerous residential and industrial developments. Also, provided expert testimony and assistance in obtaining permits.

**Hampton, New Hampshire**

Identification of primary, secondary and indirect recharge areas to the supply wells of the municipal water system. Watershed protection guidelines were developed and recommendations made for installation of several monitor wells and enactment of a regular monitoring program.

**Massachusetts and New Hampshire**

Evaluation of supply wells and operations for seven member companies of the American Water Works Service Corporation resulting in recommendations to improve well yield and system operations.

**Parkersburg, West Virginia**

Utilization of a computer model to evaluate the effects of dredging in the Ohio River on nearby industrial water-supply wells, heavily dependent on river infiltration.

**Rockland County, New York**

Computer model analysis of the Spring Valley Water Company's 14 mgd Ramapo Valley Well Field in a buried glacial valley environment. Of primary concern was defining the effects of well field operation on flow in the Ramapo River and developing an optimum well field management plan in regard to various flow conditions of the river.

**Saudi Arabia**

Model evaluation of a proposed 40 mgd well field for the King Khalid Military City under numerous situations and well combinations. Pump design and specifications were based on the model results.

**Biron, Wisconsin**

Supervised the design, permitting and construction of a 16-inch water main to connect a new 500 gpm supply well with an existing storage tank. The design and permitting for the well house and water treatment for disinfection and corrosion control was also completed.

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**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Mount Olive, New Jersey**

Supervised the design of a water main to connect a new 800 gpm supply well with an existing storage tank, well house, and water treatment for disinfection and corrosion control. Provided technical support during construction and start-up of the well.

**Somers, New York**

Supervised the design, including plans and specifications, of wells, hydraulic controls and transmission piping for separate multiple well systems for irrigation.

**Lewisboro, New York**

Supervised the design, including plans and specifications of a well, hydraulic controls and transmission piping for a potable water supply at an office building. Technical support was provided to obtain the necessary permits and approvals.

**Mt. Kisco, New York**

Designed equipment, piping and pump house to collect water from a well field comprised of four bedrock wells with a design yield of 240 gpm, to treat the water for disinfection, corrosion control and radon, and to convey the treated water to the existing municipal potable water distribution system. The work included coordination of contractors during construction and obtaining the necessary permits and approvals for constructing and operating the wells and treatment system.

**Greenwich, Connecticut**

Evaluated and designed a potable water system to serve a private school. The work for the system included pumps for the bedrock wells, filtration, iron treatment, disinfection, atmospheric and pneumatic storage tanks, booster pumps, and operational and backup controls. Testing was conducted and applications prepared for State permits, which were obtained on behalf of the client. Coordinated construction oversight and system start-up.

**Deep River, Connecticut**

Evaluated and designed upgrades to potable water systems in junior and senior high schools as part of the schools renovation projects. The work for the system included pumps for the bedrock wells, piping from the wells to the utility rooms in each school, filtration, and disinfection. Testing was conducted and applications prepared for State permits, which were obtained on behalf of the client.

**Westport, Connecticut**

Conducted a second opinion review of a watershed analysis to check the results of a TR-20 and HEC-1 analysis of a frequently flooding stream. The review included an assessment of the adequacy of the proposed stream channel modifications. A design of a small earthen berm was prepared to protect the client's property and presentations were made to local agencies to obtain approvals for construction.

**Stamford, Connecticut**

Provided expert witness services with regard to storm water runoff from adjacent properties causing damage to the client's property. The work included a site investigation of runoff patterns, technical assistance to the attorney, and testimony in court.

**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**New Milford, Connecticut**

Evaluated the impact of a proposed condominium development on the surface water and groundwater runoff to onsite and offsite wetlands. The work included a site inspection, evaluation of the development plans, identification of the watershed and its characteristics, review of published data, and representation of the client before a local regulatory agency.

**New Canaan, Connecticut**

Completed a second-opinion technical review for the municipality of the storm water management plan for a 60-unit residential development that had been submitted to the municipality for approval.

**Ridgefield, Connecticut**

Provided expert witness services with regard to storm water runoff from an adjacent property causing damage to the client's property. The work included a site inspection, review of available technical information, investigation of runoff patterns, review of depositions, technical assistance to the attorney prior to and during the trial, and testimony in court.

**New Rochelle, New York**

Developed a plan to control the entry of offsite storm water runoff onto a property and to control the onsite process water and storm water. The work was completed in response to an Order of Consent that had been issued by the New York State Department of Environmental Conservation to the property owner. The plan was approved and implemented.

**Deep River, Connecticut**

The existing onsite septic systems for the junior and senior high schools were evaluated and upgrades were designed as part of the overall renovations of these facilities. The work included field testing, review of existing sanitary flows and projection of future sanitary flows, evaluation and design of upgrades to meet current regulations, preparation of plans and specifications, coordination with local and state regulatory agencies, and preparation of applications to obtain necessary local and state approvals.

**New Castle, New York**

Supervision of watershed hydrologic analysis using TR-20 and HEC-1 to assess the affects of storm water runoff at a residential development. The results were used to evaluate runoff control measures and to design control structures for a pond on the property.

**Danbury, Connecticut**

Supervised the watershed analysis to determine the pond surface elevation from a 100-year storm, the value of which formed the basis for designing repairs to a small earthen dam. Computer models TR-20 and HEC-1 were used in the analysis to evaluate and design modification of the pond outlet. Supervised the repairs made to the dam and documented the work in a report. Coordination with state and local agencies was required throughout the project.



**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Greenwich, Connecticut**

Evaluated the hydrology and hydrogeology to assess the viability of a pond proposed for a residential estate. The work included storm-water runoff analysis, pond, berm and spillway design, flow routing through the proposed pond and spillway, evaluating the downstream conditions under possible flooding events, and representation of the client before local and state regulatory agencies.

**Milford, Connecticut**

Completed a pre- and post-development storm water runoff analysis for a proposed golf course. Storm water management controls were evaluated and designed, including a detention pond and an onsite storm drain system consisting of catch basins, pipe and a grit/oil/water separator. Runoff channels were designed and a plan was developed for erosion and sediment control. Floodway and floodplain hydraulic analysis of the adjacent river were completed to evaluate the potential for site development to impact water flow during larger storm events. Evaluated and designed an 11,000 gpd on site septic system for the treatment of sanitary wastes from the clubhouse, which includes a restaurant and banquet facilities. The work included field testing, projection of sanitary flows, preparation of plans and specifications, and preparation of applications to obtain local and state permits.

**Sharon, Connecticut**

Completed a hydrologic watershed analysis to determine peak runoff from storm events, evaluated and redesigned an existing spillway on a dam to allow passage of the peak runoff, evaluated downstream impacts from a hypothetical dam breach to prepare an emergency operations plan, and prepared plans and specifications for various repairs and improvements to the dam and spillway. The work was complete in response to a Consent Order from the Connecticut Department of Environmental Protection.

**Redding, Connecticut**

Developed plans and specifications for dredging an irrigation water storage pond at a golf course in order to restore the capacity of the pond. Alternatives for enlarging the pond were examined and compared with options for increasing the irrigation supply sources. Plans and specifications for maintenance of a 5-pond/stream system were also prepared. The work included delineation of contributing watersheds, calculation of peak flows and development of BMPs for sediment control.

**SPECIFIC EXPERIENCE IN WATER RESOURCES, SUPPLY AND MANAGEMENT (continued)**

**Danby, Missouri**

Completed a hydrologic analysis of pre- and post-development storm water runoff of a proposed limestone quarry; the results are being used to design storm-water management and erosion controls. Sedimentation basins were designed to serve the dual purpose of capturing sediment and controlling the release of storm water runoff. The analysis and preliminary design of a sedimentation basin for the disposal of about 850,000 cubic yards of dredged sediments was also completed, including a 130 foot high rock fill dam to serve as the impounding structure for the basin. Engineering reports and drawings were prepared to support applications for construction with the state and the Army Corps of Engineers.

**SPECIFIC EXPERIENCE IN WATER RESOURCES, SUPPLY AND MANAGEMENT (continued)**

**Bedford, New York**

Evaluated the hydrology and hydrogeology to assess the feasibility of a pond proposed for a residential estate. The work included watershed delineation, test pits to assess soil and groundwater conditions, storm-water runoff analysis, pond and spillway design, flow routing through the proposed pond and spillway, checking the capacity of nearby storm sewers, and representation of the client before local and state regulatory agencies.

**Portland, Connecticut**

The options for draining a 3.3-acre quarry pond were evaluated. A hydrologic evaluation of the watershed was completed in order to design sediment and erosion controls, and to prepare runoff management controls to minimize impacts to nearby wetlands and streams. The potential for quarry restoration to impact groundwater was also evaluated. Wetlands were mapped and a site plan was developed. Detailed plans of the options were prepared. Applications for permits from the local Planning & Zoning Commission and Inland Wetlands Commission were prepared and submitted. The client was represented at public hearings for both local agencies. Meetings were held with CTDEP staff to discuss permitting requirements and procedures for the project.

**Chappaqua, New York**

Completed a hydrologic analysis of a pond in a residential community, including watershed delineation, calculation of runoff, and routing through a sedimentation basin to reduce materials from accumulation in the pond. The spillway structure was redesigned to minimize flooding that occurred during storm events. Maintenance and dredging of the pond was included.

**Bethel, Connecticut**

The feasibility of a 0.2-acre pond in a low-lying area on a 5-acre residential property was evaluated, which included the mapping of wetlands and the preparation of a site plan. The watershed hydrology was evaluated, and the soils and groundwater levels were investigated. Detailed plans and specifications were prepared for use in permitting and construction. Applications for both Planning & Zoning and Inland Wetlands permits were prepared and coordinated through the review, public hearing and comment process. Construction oversight was provided and routing construction status reports were submitted to the town. As-built plans of the pond were prepared and submitted to the town in order to meet a condition in one of the permits.

**Chappaqua, New York**

Plans to conduct maintenance dredging in a portion of a 9-acre pond were evaluated to provide a second opinion to the owners. The hydrology of the watershed was evaluated. BMPs were examined for potential application in the watershed to reduce the volume of sediment being carried into the lake. Local, state and federal permitting requirements were identified and summarized for the owners. The planned method for dredging was reviewed, along with the plans for disposal of the dredged sediments. Recommendations were made to supplement the planned maintenance dredging with the construction of sediment traps on the tributaries to the lake.

**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Greenwich, Connecticut**

The watershed hydrology, storm water runoff, and capacities of the stream/pond system throughout the 150-acre, 18-hole golf course were evaluated. A detailed runoff analysis was completed to estimate peak flows for various storm events. Options were evaluated to reduce flooding which frequently occurs during storm events. Culvert and stream channel capacities were calculated and potential improvements evaluated. Based on a bathymetric survey of the bottom of the large pond, options for the ponds were evaluated to improve storm water management capabilities and increase storage volume in consideration of the need for irrigation at the golf course. Construction plans were prepared for removal of sediment from streams and ponds, for modification to pond outfalls, and for new culverts. Volumes of sediment to be removed from the ponds were estimated for each option. The cost of each option were estimated and presented to the client. Applications for local, state and federal permits were prepared and submitted. Local permits were obtained.

**Torrington, Connecticut**

To increase the storage capacity of ponds used for irrigation water, an evaluation and design was completed to remove existing sediment to deepen and enlarge two ponds. The work included a bathymetric survey of the bottoms of the ponds, evaluation of the hydrology and water flow through the ponds, design for a new outlet, preparation of construction drawings, support of the permit application to the municipality, preparation and support of an application with the CTDEP, and coordination with the Army Corps of Engineers. Upon receipt of all approvals, assistance was provided in contractor bidding and selection.

**Clarksville, Missouri**

As the main component of a stormwater management program to facilitate expansion of a limestone quarry, a 1,400-foot long, 35-foot high dam was designed to intercept streamflow. The work included a hydrologic evaluation of the watershed and determination of streamflows, evaluation of soil data obtained from borings drilled in the footprint of the planned dam, design of the dam and outlet, and preparing, submitting and supporting applications with the state and Army Corps of Engineers. Construction supervision was provided. The finished project resulted in the creation of a 20.5-acre lake and a 2,500-foot channel that conveyed the streamflow to an adjacent watercourse.

**Bedford Corners, New York**

Completed evaluation and design tasks to deepen and enlarge a pond on a residential/agricultural estate. The work included a bathymetric survey of the pond bottom, inspection of the dam, evaluation of the hydrology and streamflow through the pond, and development of an engineers report and construction drawings that were used in support of an application for a local permit.

**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Stamford, Connecticut**

Inspected a masonry stone dam on a community pond to assess the source of water flowing out of the ground a short distance downstream of the dam. The work also included a review of construction drawings for the dam and interviews with people familiar with the dam and pond. The water was determined to be from the spillway and was being diverted through stone riprap at the base of the dam by the accumulation of leaf debris and vegetation. The water was not seepage under the dam. The findings were summarized in a letter that was submitted to the CTDEP. Assistance was also provided for preparation of an Emergency Operations Plan.

**Mt. Kisco, New York**

The viability of creating a pond on a private estate was assessed by evaluating the hydrologic conditions, groundwater levels, and soils in the location of the proposed pond. Due to the small contributing watershed, augmentation of the water in the pond with water from an irrigation well was projected to be necessary during dry periods. Design of the pond and outlet was completed, and construction drawings were prepared and used in obtaining a permit from the town.

**Katonah, New York**

To alleviate flooding conditions in the area of a pond on a residential property, an evaluation was completed to identify modifications to the pond and outlet that would reduce the magnitude and frequency of flooding during larger storm events. Construction drawings were prepared that included the removal of sediment from the pond and reconstruction of the outlet.

**Croton-On-Hudson, New York**

Evaluation of the significance and severity of seepage downstream of a masonry stone dam and inspection of the condition of the dam. Approaches to fix the seepage and make repairs to the dam without drawing down the lake were evaluated. For each approach, the ease of implementation and regulatory approval requirements were evaluated. A report that summarized the advantages, disadvantages and costs of the various approaches was prepared and submitted to the owner.

**Redding, Connecticut**

Assessed the viability of constructing a pond on a residential estate. The soils, groundwater level and contributing watershed were evaluated to develop a design in which the outlet elevation was selected to maximize the utilization of groundwater as the source of water to the pond. Cuts into the hillside were balanced by fills for the berm in order to create the pond.

**Fairfield, Connecticut**

Assessed the viability of constructing a pond on a residential property. The soils and groundwater levels were evaluated by drilling borings and a hydrologic evaluation of the contributing watershed was completed to define surface water contribution to the proposed pond. A preliminary design for the pond, the normal water level in the pond and the outlet was prepared.

**SPECIFIC EXPERIENCE IN WATER SUPPLY, RESOURCES AND MANAGEMENT (continued)**

**Pawling, New York**

Repairs to a combined stone masonry/earth fill dam were assessed and designed to stop leakage through the dam. The work included an inspection of the dam, development of an approach for stopping leakage, preparation of construction drawings for the repairs, coordination with the municipality for the work permit, and construction supervision.

**Orange, Connecticut**

Evaluated the condition of a farm pond dam and the cause of water observed below the dam to determine the ability of the pond and dam to accept stormwater runoff from planned commercial development of the property. The dam was inspected and the proposed storm water management system was reviewed to compare the rate and volume of storm water to enter the pond with the storage capacity of the existing pond. Repair and maintenance items for the dam and an outlet from the pond were recommended.

**North Salem, New York**

Evaluated the cause of road runoff flowing through a residential property and depositing sand and sediment into a farm pond. The contributing watershed was defined and options for rerouting the runoff and eliminating sediment deposition to the pond were identified and summarized for the owner. Represented the owner in negotiations with the town in order to implement corrective actions.

**Newtown Square, Pennsylvania**

In response to a directive to the owner from the state, measures to repair identified deficiencies were developed. The dam and conditions were inspected, a hydrologic analysis was completed to understand flows into the pond and through the outlet of the dam, modifications to the outlet were designed, and construction drawings and specifications were prepared. A breach analysis was completed to define the downstream inundation area as part of the Emergency Operation Plan that was prepared to meet regulatory requirements.

**Doylestown, Pennsylvania**

An Emergency Operations Plan was prepared to meet regulatory requirements. The work included an inspection of the pond, dam and outlet, an evaluation of the outlet and flow through the pond, and a breach analysis to define the downstream inundation area.

## **SPECIFIC EXPERIENCE IN SOIL & GROUNDWATER CONTAMINATION**

### **Apple Valley, Minnesota**

Design and implementation of a recovery/treatment system to eliminate free hydrocarbon product and reduce to acceptable levels the dissolved components of hydrocarbons in the water table aquifer at a petroleum bulk storage terminal.

### **Brooklyn, New York**

Monitoring of fluid levels and conducting aquifer pump tests in order to define the extent of hydrocarbon product and implement a recovery system at a terminal and tank farm. Computer evaluation of various recovery techniques. Design of a multi-well system for the recovery of free product and remediation of groundwater containing VOCs.

### **Danbury, Connecticut**

Conducted an environmental site assessment on an industrial property which was found to have soils containing lead and hydrocarbon compounds. Alternatives were evaluated; remediation of soil was coordinated and supervised.

### **Deepwater, New Jersey**

Development of a computer program which contoured water-level and water-quality data for use in monitoring the multi-aquifer system and evaluating the effectiveness of the recovery well system in containing and reducing chemical concentrations at a chemical manufacturing facility.

### **West View, Pennsylvania**

Development of a ground-water computer model to evaluate proposed remedial measures to prevent the further contamination of public water-supply wells from chemicals emanating from a nearby chemical plant.

### **Plumstead Township, New Jersey**

Project Manager of hydrogeologic investigations for the Remedial Investigation/Feasibility Study at three Superfund sites. These studies were directed at defining the extent of contamination and evaluating alternatives for remediation. Investigative techniques included electromagnetic terrain conductivity and multi-level monitor wells.

### **Watertown, Wisconsin**

Conducted a Feasibility Study for remediation of ground water and soils containing VOCs and developed conceptual design of remedial system. Detailed design of systems for recovery and treatment of groundwater and soils. Supervised construction management, start-up activities, and operation and maintenance of the systems.

### **Suffern, New York**

Technical manager of computer modeling of TCEA plume in the vicinity of a municipal well field. The solute transport model was developed from field data obtained during the Remedial Investigation and was used to evaluate alternatives during the Feasibility Study for this Superfund listed site.

**SPECIFIC EXPERIENCE IN SOIL & GROUNDWATER CONTAMINATION  
(continued)**

**Paulsboro, New Jersey**

Assisted in the evaluation and design of liquid hydrocarbon recovery system installed in the water table aquifer at a petroleum refinery. Periodic review of recovery system to ensure continued operation. Computer modeling to evaluate effectiveness of recovery system and estimate remaining product in the aquifer. Design and implementation of an investigation and monitoring program for potential contamination in deep aquifers at the site. Alternatives for remediation were evaluated and a recommendation was made to the client.

**Connecticut and New York**

Numerous Phase I and II environmental assessments of Properties in Connecticut and New York to define site conditions and potential risks associated with hazardous or toxic chemicals. The information developed is used by involved parties prior to transfer of property ownership or refinancing.

**Guayama, Puerto Rico**

Completed a Feasibility Study at a CERCLA site involving TCE contamination of several public supply wells and asbestos in soils. Various processes were identified and alternatives were evaluated in detail, including cost analysis, according to EPA FS protocols.

**Greenwich, Connecticut**

Design of a hydrocarbon/groundwater recovery system at a maintenance garage for an electric utility company. The system included wells equipped with air-ejector pumps which discharged to a treatment unit. Engineering drawings and specifications were provided for contractor use and as-built drawings were supplied at the completion of the project.

**New Windsor, New York**

Design of a hydrocarbon/groundwater recovery system at a petroleum terminal/tank farm. The system included a high capacity recovery well, equipped with a pump that discharges to an air stripper. Effluent from the air stripper flows to the municipal sewer. The system was equipped with automatic controls and winterized to allow year-round operation. The work included construction management and system start-up and operation.

**Patterson, New York**

Design of a leachate collection and treatment system, including rerouting the drainage of surface water, at an unauthorized non-hazardous industrial waste landfill. The leachate collection system will mitigate the potential impact of the landfill on adjacent wetlands and is the first stage in the overall remediation of the landfill.

**New Fairfield, Connecticut**

Managed an environmental site assessment that identified contaminated soils and a potentially leaking UST. Follow-up work included closure and removal of the UST and excavation of soils with hydrocarbon product. The remediation of soils contaminated by waste coolants was also coordinated.

**SPECIFIC EXPERIENCE IN SOIL & GROUNDWATER CONTAMINATION**  
(continued)

**Connecticut**

Supervision of numerous projects for preparing Storm Water Pollution Prevention Plans, coordination with clients to implement the plans, and supervision of monitoring and sampling efforts conducted for the clients to meet regulatory requirements. Several sites included design of runoff treatment and control measures.

**North Branford, Connecticut**

Supervision of a Phase II investigation targeted on a PCE release at a former dry-cleaning establishment. Evaluation of remedial options and costs. Coordination with state agencies and clients (attorneys). Presentation of expert witness testimony.

**Gaithersburg, Maryland**

Review of technical file, coordination with the client and attorneys, presentation of expert witness testimony for case involving liability of planned remediation of petroleum contamination in soil and groundwater at a service station.

**East Hartford, Connecticut**

Supervised the closure of two 20,000-gallon USTs, including remediation of impacted soil and groundwater, and the installation of a 10,000-gallon AST. The work included design of base support for the AST and technical support for obtaining state and local permits and approvals.

**BIBLIOGRAPHY**

"The Ramapo Valley Aquifer Model: A Case Study of Aquifer Modeling for Well Field Management Alternatives," Proceedings of the NWWA Eastern Regional Conference on Ground-Water Management, November 1983.

"Considerations in the Development of a Ground-Water Contaminant Transport Model," presented at the 36th Annual Meeting of the AWWA-Pennsylvania Section, April 1984.

"Computer Aided Design of Ground-Water Monitoring Programs," Proceedings of the ASCE Hydraulics Division Specialty Conference on Hydraulics and Hydrology in the Small Computer Age, August 1985.

"Well Field Management Designed to Minimize Impact on Surface Water Flow," Proceedings of the ASCE Symposium on Engineering Hydrology, August 1987.





Michael Susca has over thirty-five years of environmental-consulting experience, including design and implementation of Phase I/II/III environmental site investigations, site remediation, permitting, and water-supply investigation. He has participated in field investigation work in fifteen states, Puerto Rico, and Jamaica. His site investigation experience includes sites such as manufactured gas plants and landfills, a wood-treatment plant, a rail yard, numerous petroleum-storage sites, dry cleaners, gas stations, and sites used for the manufacture of pharmaceuticals, consumer products, chemicals, adhesives, electric motors, and aerospace products. His work has included investigations of several USEPA- and State-funded 'brownfields' sites in Connecticut and remediation of petroleum, PCBs, solvents, metals, semi-volatile organics, and pesticides contamination on a number of sites.

## **EDUCATION**

B.S. in Geology and Geophysics, 1980, University of Connecticut, Storrs, Connecticut

M.S. in Environmental Sciences, 1994, University of New Haven, New Haven, Connecticut

Coursework in Construction Management and Occupational Safety, Central Connecticut State University, New Britain, Connecticut

## **REGISTRATION**

Licensed Environmental Professional in the State of Connecticut (#197)

Certified Professional Geologist, American Institute of Professional Geologists (#7210)

## **TECHNICAL SOCIETIES**

American Institute of Professional Geologists

The Environmental Professionals' Organization of Connecticut

## **SUMMARY OF PROFESSIONAL EXPERIENCE**

### **2006 to present:**

Associate and Senior Associate with Leggette, Brashears & Graham, Inc., Farmington, Connecticut

### **2005 to 2006:**

Project Manager / Senior Consultant with GeoQuest, Inc., Bloomfield, Connecticut

### **2004 to 2005:**

Self Employed Environmental Consultant

### **1988 to 2004:**

Senior Project Manager with TRC Environmental Corporation, Windsor, Connecticut

### **1985 to 1988:**

Project Manager with Hart Environmental Management Corporation, Rocky Hill, Connecticut

### **1980 to 1985:**

Hydrogeologist with Leggette, Brashears & Graham, Inc., Wilton, Connecticut

## **EXAMPLES OF SPECIFIC EXPERIENCE IN SOIL AND GROUNDWATER CONTAMINATION INVESTIGATION AND REMEDIATION**

### **Brownfields Sites, Connecticut**

Project Manager for the investigation of several State- and USEPA-funded 'brownfields' sites that had been developed in the late 1800s and had been used for heavy manufacturing but were underutilized or abandoned. Prepared individual QAPPs for USEPA review, implemented and documented Phase I/II/III investigations, and prepared remediation cost estimates. Designed and completed soil remediation under TSCA at one site.

### **Manufacturing Sites, Investigation and Remediation**

Project Manager for a Phase II/III investigation and remedial action at an aerospace-parts manufacturer in Connecticut under the Property Transfer Act. Several areas of concern were identified and investigated, and remedial actions, including a TSCA-regulated soil removal, were conducted.

Project manager for the Phase III investigation and remediation of urban soil and coal ash at a commercial property undergoing extensive renovation and subject to Connecticut's Property Transfer Law. Remediation was conducted in two phases and consisted of the removal and off-site disposal of 30,000 tons of soil, the removal of an underground fuel-oil storage tank and a 100,000-gallon concrete underground holding tank. Remediation also required obtaining a local wetlands permit for remediation in a regulated area and implementing the permit-required restoration. The work was completed and the site was restored prior to tenant move in.

**EXAMPLES OF SPECIFIC EXPERIENCE IN SOIL AND GROUNDWATER CONTAMINATION INVESTIGATION AND REMEDIATION (continued)**

Project Manager for groundwater remediation and monitoring at a former metal-forming manufacturer in Connecticut under RCRA and the Property Transfer Law. A residual chlorinated-solvent plume in groundwater was remediated using in-situ injection of zero-valent iron and an organic substrate under a State approval following plume containment and reduction through hydraulic controls.

Project Manager for Phase II and Phase III investigations and soil remediation at a former adhesive plant in Connecticut under the Property Transfer Law. Soil remediation, post-remediation monitoring, RCRA closure sampling, and equipment decontamination and removal were also completed.

Project Manager for a Phase II site investigation, including soil, groundwater and soil gas sampling at a former electric-motor manufacturer in Pennsylvania. The program included the installation of bedrock monitoring wells and statistical evaluation of background ground-water contamination in accordance with Act 2 and Land Recycling Program requirements.

Field investigator for groundwater investigation at an active wood-treatment plant in South Carolina. Activities included the installation of monitoring-well clusters, groundwater sampling, pumping tests, recovery-well installation, private-well sampling, and data evaluation.

**USEPA and State "Superfund"/CERCLA Actions**

Manager of investigation and remediation on behalf of the PRP at a Connecticut site that received ash and incinerator waste disposal from a manufacturing plant. The remedy involved the removal of contaminant 'hot-spots' and regrading and capping the site under USEPA oversight. Proposed and implemented a supplemental sampling plan that reduced the overall cost of remediation.

Field supervisor for site investigations at three former New Jersey farms used for the illegal disposal of possible hazardous wastes. Project Manager for the screening investigation for sources of chlorinated-solvent contamination to a New Jersey municipal water-supply well. That investigation identified several possible contaminant source locations.

Manager of field investigations at a former municipal and industrial waste landfill in New York. Activities included the development of a Field Sampling Plan and Quality Assurance Plan, the implementation of the sampling plan (including geophysical investigations, the assessment of hydrogeologic conditions through the installation of well nests and the collection of soil and groundwater samples), assessment of the data and development of a comprehensive Remedial Investigation Report.

**RCRA Sites/RCRA Facility Investigations**

Field manager for the implementation of a RCRA Facility Investigation on an active pharmaceutical plant in karst terrain in Puerto Rico. The investigations addressed numerous solid-waste management units (tanks, pipes, water treatment facilities including lagoons and a landfill), and included an extensive boring program, soil-gas investigations and soil sampling in a confined space using Level B protective equipment.

**EXAMPLES OF SPECIFIC EXPERIENCE IN SOIL AND GROUNDWATER CONTAMINATION INVESTIGATION AND REMEDIATION (continued)**

Technical manager for a Voluntary Corrective Action RCRA Facility Investigation at a Connecticut consumer-products manufacturing site that involved the investigation of the three-dimensional extent of a plume of chlorinated solvents, including investigations in wetland discharge areas and soil-quality investigations in potential source areas.

Technical manager for the development of a soil-gas sampling plan to assess potential exposures (Environmental Indicators) from known plumes of volatile organic plumes in groundwater underlying an active chemical plant in Illinois. The sampling plan was reviewed and approved by USEPA Region V, two rounds of soil gas samples and indoor air samples were collected and potential exposure risks were assessed.

**Petroleum Investigation and Product Recovery, Various Sites, New York City**

Project manager for the evaluation of underground fuel storage sites for three major clients. Under three consecutive contracts with one public agency, site visits were conducted and site investigations were planned and implemented at over 80 sites. Where significant free product was present (nos. 2, 4 and 6 fuel oil), free-product remediation systems were designed. For a second client, free-product investigations and free-product removal was performed at two sites, including one where there was oil discharge to a navigable waterway. Product recovery and system performance were evaluated at selected sites to improve product recovery rates and address operation problems. For a third client, Mr. Susca was technical manager for the design, implementation and evaluation of investigations at approximately 25 motor fuel dispensing sites used by fire, police and emergency services. Above work was subject to NYSDEC review.

**Site Investigations, Numerous Gas Stations in New York and Connecticut**

Field coordinator for two multiple-site pre-purchase screening investigations in upstate New York involving site visits, soil gas surveys and selective groundwater investigation to assess potential environmental liabilities. Project manager for site investigations at retail sites in Connecticut, including groundwater remediation/containment.

**Site Investigation and Remediation, Dry Cleaners, Connecticut**

Evaluated existing site investigation data, designed and implemented additional site investigations where necessary to evaluate contamination extent and compliance with the Connecticut RSRs on several sites. Investigations included soil and groundwater sampling, soil gas sampling, and indoor air sampling. Implemented soil vapor extraction at one site to contain vapor migration, and prepared a request for temporary discharge to groundwater to test chemical oxidation at a site with an extensive dissolved plume.

**Emergency Response**

Part of LBG team that provided oversight of emergency-response actions at pipeline-related petroleum-release sites in Illinois and Oklahoma.

**Michael Susca, CPG, LEP (continued)**

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**EXPERIENCE IN WATER-SUPPLY INVESTIGATION**

**Parkersburg, West Virginia**

Field inspector for the installation of water-supply wells at a manufacturing plant.

**Haddam Neck, Connecticut**

Field inspector for site evaluation and pumping tests at a nuclear power plant site.

**Evansville, Indiana**

Field inspector for water-supply well redevelopment at a manufacturing site.



Corey Hedges has a wide range of hydrogeologic experience in the field including the supervision of drilling and remediation contractors using direct push and drive techniques, and supervision of monitoring and recovery well installation. Others include collection of soil and groundwater samples; participation in constant rate and step pumping tests; and post-excavation closure sampling. She has experience in environmental sampling techniques encompassing low-flow/low-stress groundwater sampling, storm-water sampling, and potable well sampling. Additional experience also includes compiling data into spreadsheets and graphs. These tasks are in support of a wide variety of projects for CTDEEP, ranging from investigations of contaminated sites to water supply investigations.

### EDUCATION

B.S. Geology, 2015, Union College, Schenectady, New York

### CERTIFICATION AND TRAINING

Health and Safety Operations at Hazardous Waste Sites, 29 CFR 1910.120(e)(3), 40 hours; with annual updates.

8-hour HAZWOPER Supervisor Training required by OSHA 29 CFR 1910.120(e)(4)

### SUMMARY OF PROFESSIONAL EXPERIENCE

#### **September 2015 to present:**

Hydrogeologist I at Leggette, Brashears & Graham, Inc., Farmington, Connecticut

### SPECIFIC EXPERIENCE IN SOIL & GROUNDWATER

#### **Bridgeport, Connecticut**

Conducted subcontractor oversight of direct push soil borings and monitoring well installations, including associated geologic logging and soil/groundwater sampling.

#### **Bristol, Connecticut**

Conducted quarterly groundwater monitoring and sampling at a large landfill site.

#### **Connecticut (various sites)**

Conducted quarterly groundwater monitoring and sampling; prepared data tables, evaluated data and associated reporting.

#### **East Granby, Connecticut**

Conducted all field tasks for completing a long-term (five-year) hydrogeologic study of a proposed quarry-expansion property. Scope included installation of level troll instruments; monthly site visits to download, record measurements on all onsite and offsite wells, piezometers, and stream flow data. Graphed results and tabulated field data for final deliverable.

## **Corey Hedges (continued)**

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### **Greenwich, Connecticut**

Conducted a 24-hour constant-rate pumping test on a school property. Investigation included recording measurements of a single well. Graphed results and tabulated field data for final deliverable.

### **Waterbury, Connecticut**

Participated in a Phase III Environmental Investigation for several areas of concern over two parcels of a former manufacturing company. Included post-excavation concrete and soil sampling to delineate the extent and concentrations of polychlorinated biphenyl contamination.

### **Chester, Connecticut**

Monitored the depth-to-water and in-situ water-quality parameters in groundwater wells and SVE system wells. Completed quarterly groundwater monitoring while compiling and evaluating data for final report.

### **Connecticut (various sites)**

Provided stormwater monitoring services for numerous shipping facilities consisting of quarterly and semi-annual stormwater site inspections, collected samples at various outfalls and prepared required reports.

### **Waterbury, Connecticut**

Participated in an environmental investigation at a former United Parcel Service facility. Scope included groundwater monitoring as part of remediation designed to monitor and remove occasional free-phase product in certain wells.

### **Monroe, New York**

Conducted a 72-hour constant-rate pumping test. Investigation included water-level measurements of various onsite wells.

### **Hudson, New York**

Conducted a two 72-hour, constant-rate pumping test. Collected and interpreted water level data and discharge information during the test. Scope included installing and monitoring onsite and offsite piezometers, monitoring of additional onsite and offsite wells. Analyzed data for determination of aquifer well specific capacity compiling data into spreadsheets and graphs.

### **Whippoorwill, New York**

Conducted a 72-hour constant-rate pumping test on a golf club property. Investigation included installing and recording measurements of piezometers, stream flow gaging and measurement of culvert flows as part of assessment of pumping impact on water balance and evaluation of water-table. Investigation also included level and mini troll installation and sampling of offsite residential wells. Graphed results and tabulated field data for final deliverable.

### **Massachusetts (various sites)**

Provided stormwater-monitoring services for numerous shipping facilities consisting of the collection and visual on-site inspection of stormwater runoff at various outfalls and quarterly stormwater site inspections with associated reporting for final deliverable.



June 13, 2019

Mr. Stephen Burke  
Associate Project Manager  
State of Connecticut  
Department of Administrative Services, Construction Services  
450 Columbus Boulevard, Suite 1305  
Hartford, Connecticut 06103

RE: Summary of Results  
DAS Project Number CF-RC-402  
Proposed Manafort Drive Parking Garage  
55 Paul Manafort Drive  
Central Connecticut State University, New Britain

Dear Mr. Burke:

WSP USA (WSP) has prepared the following letter to document work conducted in accordance with our proposal to the Connecticut Department of Administrative Services (DAS) Construction Services (CS) dated August 3, 2017 and subsequent purchase order number DAS10008. The work documented below was conducted in August 2018. A draft letter was submitted to Ms. Rebecca Cutler on October 3, 2018. Fifty-percent design drawings were provided to WSP on March 11, 2019.

### **Background**

The project location (“the Site”) is immediately south of the Central Connecticut State University (CCSU) campus proper, in an area currently used as a paved parking lot adjacent to the Charter Oak State College (figure 1). The proposed construction project will involve excavation, site preparation and construction of an approximately 53,000 square foot (289 feet by 185 feet footprint), multi-level parking garage, as shown on preliminary plans prepared by Desman Design Management, architect for the project.

A Phase I environmental site assessment (ESA) was conducted by Leggette, Brashears & Graham, Inc. (now WSP) in September 2017 on behalf of DAS/CS. The ESA report indicated that there was no historical information or observations that suggested that there had been a release of petroleum or hazardous substances on the Site. However, the ESA report indicated that there had historically been several residential buildings on the Site and there was no information to confirm that the building debris, foundations and any associated petroleum-storage tanks had been removed. In addition, based upon the site grading, it appeared likely that fill may have been imported to the Site for parking lot construction. The ESA also identified historical gasoline stations and petroleum storage on properties to the west of the Site. Given the presumed direction of groundwater flow below the Site (toward the east or northeast), a significant petroleum release at the off-site location could impact groundwater quality below the Site.

The scope of services consisted of collecting and analyzing soil and groundwater samples from the proposed construction area. Because excess soil may be generated from the construction activities, soil quality was evaluated relative to disposal or reuse. Groundwater quality data were evaluated to provide an indication if treatment will be necessary if dewatering is required.

WSP USA  
Formerly  
Leggette, Brashears & Graham  
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### **Boring Locations**

Ten boring locations (nine locations on the Site and one off Site) were selected by Freeman Companies, the geotechnical engineer on the project, for the purpose of obtaining geotechnical information at the proposed parking garage location. WSP provided some input on the locations, requesting small adjustments in the locations of borings 4 and 8, which were incorporated in the boring location plan. Borings 4 and 8 were relocated to be within the presumed footprints of two of the historical structures on the Site. The approximate boring locations are shown on attached figure 2. The boring locations were marked in the field by others prior to drilling. Drilling, soil-sampling and well-installation services were coordinated by others.

No details about the proposed garage construction were provided to WSP in advance of the drilling, but it was WSP's understanding that a portion of the lowest garage level will be below grade and that the structure may require piers/pilings to the underlying bedrock. Based upon this information, the following soil and groundwater samples were collected.

- Shallow soil samples (representing the upper 5 feet below grade, ft bg) were collected at borings B-4, B-5, B-7 and B-8 to characterize the soils that would likely be excavated to construct the garage.
- Deeper soil samples were collected at borings B-5 and B-8 to characterize soil that might be removed during piling construction.
- One groundwater sample was collected from a well installed at boring B-5 (presumed to be downgradient of the former, off-site gasoline station to the west).

### **Soil Sampling**

Drilling and well installation was supervised and coordinated by others; WSP was on site to observe drilling and collect soil samples only at selected locations. Drilling services were provided by New England Boring Contractors of Glastonbury, Connecticut and were conducted during the week of August 13, 2018. Borings were drilled using the hollow-stem auger method and soil samples were collected using two-foot-long split-spoon samplers. Soil samples were collected on a continuous basis between 1 ft bg and 9 ft bg and at five-foot intervals thereafter. The borings were terminated at drilling refusal (presumed to be bedrock).

WSP screened samples from selected borings for volatile organic vapors (evidence of certain types of pollution) with a photoionization detector (PID), logged selected soil samples, and collected selected soil samples for laboratory analysis. No positive PID readings were noted. Six soil samples were collected, placed into laboratory-supplied glassware, labelled and placed on ice in the field. The samples were held overnight in WSP's sample refrigerator until pickup by the courier for Phoenix Environmental Laboratory of Manchester, Connecticut (a DAS contract laboratory) the following day. Samples were submitted for laboratory analysis, as noted below.

<b>Boring Number</b>	<b>Sample Depth (ft bg)</b>	<b>Laboratory Analyses</b>
B-4	1-5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization
B-4	4	VOC
B-5	1-5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization, SPLP pesticides, SPLP RCRA 8 metals
B-5	4.5	VOC
B-5	5-35.5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization



Boring Number	Sample Depth (ft bg)	Laboratory Analyses
B-5	35	VOC
B-7	1-5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization
B-7	2.5	VOC
B-8	1-5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization, SPLP pesticides
B-8	3.5	VOC
B-8	5-31.5	SVOC, PCB, RCRA 8 metals, ETPH, herbicides, pesticides, waste-characterization
B-8	31.5	VOC

ft bg feet below grade  
VOC volatile organic compounds by Method 8260  
SVOC semi-volatile organic compounds by Method 8270  
PCB polychlorinated biphenyls by Method 8082 using Soxhlet extraction  
RCRA 8 metals – Resource Conservation and Recovery Act (RCRA) metals, arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver  
ETPH Connecticut extractable total petroleum hydrocarbons  
Herbicides by Method 8151  
Pesticides by Method 8081  
SPLP Synthetic Precipitation Leaching Procedure  
Waste-characterization parameters include corrosivity/pH, ignitability/flashpoint, reactivity, Paint Filter Test

Samples were analyzed as noted above using Connecticut’s Reasonable Confidence Protocol methods (not applicable to waste-characterization tests).

**Monitor Well Installation and Groundwater Sampling**

Monitor wells were installed in several borings under the direction of Freeman Companies. The monitor well that was installed at the B-5 location was selected for the collection of a groundwater sample. That well was constructed with 10 feet of screen set from 23.5 to 33.5 ft bg. WSP developed the well by pumping on August 14, 2018, however, there was a significant accumulation of silt in the well. Despite that, the well yielded a significant amount of water, although the discharge remained cloudy at the conclusion of development and sediment remained in the well following development. One groundwater sample was collected from the well using the USEPA low-flow/low-stress sampling method on August 17, 2018. The sample was submitted to Phoenix for analysis for VOCs, SVOCs, ETPH, PCBs and dissolved (filtered) RCRA metals.

**Soil Characteristics and Sample Analytical Data**

The borings encountered fine sand and silt and fine to medium red-brown sand in the upper 5 to 20 ft bg, with somewhat coarser sand observed below 20 ft bg and clay and silt observed above bedrock (B-5). Drilling refusal, presumed to be bedrock, was encountered at an approximate depth of 33.5 and 35 ft bg (B-5 and B-8, respectively). There were no odors, stains or positive PID readings noted in the samples that WSP inspected, however, brick was observed in boring B-5 at a depth of 8 ft bg. Boring logs for those borings and intervals that WSP inspected are included in Attachment I.

The analytical results for the soil samples are summarized on the attached tables 1 and 2 and the analytical results for the groundwater sample are summarized on table 3. The laboratory reports are provided in Attachment II.



VOCs, herbicides and PCBs were not detected in any soil samples. The concentrations of metals were all less than the residential Direct Exposure Criteria (RDEC)<sup>1</sup> and at or close to typical background levels.

ETPH was detected in samples B-4(1-5), B-5(1-5), B-7(1-5) and B-8(1-5). The reported concentrations ranged from 69 to 280 milligrams per kilogram (mg/kg) and all were less than the RDEC and the GA PMC (500 mg/kg). Carbon ranges in the samples varied from C9 to C36 [B-4(1-5), B-7(1-5)] to C14-C36 [B-5(1-5)] and C26-C36 [B-8(1-5)], but specific hydrocarbon types were not identified by the laboratory.

Two polynuclear aromatic hydrocarbon compounds (PAHs) were detected only in sample B-5(1-5). PAHs are a subset of the SVOCs and are commonly found in heavy hydrocarbons, such as asphalt. The reported concentrations were less than the RDEC and the GA PMC. Given that this was a near-surface soil sample and the surface cover in this area is asphalt, there is the possibility that the PAH detection results from asphalt being inadvertently introduced to the sample.

The pesticide 4,4'-DDT (DDT) and its degradation product 4,4'-DDE (DDE) were detected at trace concentrations in samples B-7(1-5) and B-8(1-5). DDT is a pesticide, the use of which was banned in the United States in 1972, however, it is not uncommon to detect it in former agricultural soils due to its persistence. Criteria for DDT and DDE are not established in Connecticut's Remediation Standard Regulations (RSRs). However, CTDEEP has published 'recommended' criteria<sup>2</sup> for the total concentration of DDT and its metabolites, DDE and 4,4'-DDD. The total DDT and DDE concentrations were less than the CTDEEP-recommended RDEC, however, the concentrations exceeded the recommended GA PMC. Because of this, these samples were extracted using the Synthetic Precipitation Leaching Procedure (SPLP) and the extracts were analyzed for pesticides to assess if they were likely to impact groundwater quality. DDT and DDE were not detected in the SPLP extract to a concentration less than the Groundwater Protection Criteria, thereby demonstrating compliance with the GA PMC.

All samples were analyzed for certain waste-characterization parameters consistent with the Resource Conservation and Recovery Act (RCRA) to determine if the soil, if generated as a waste, would be a characteristic hazardous waste (ignitable, corrosive or reactive) under RCRA. This testing also included the Paint Filter Test for free liquids, which is also often required for approval of non-hazardous wastes at disposal facilities. The testing confirmed that the soil samples did not exhibit these hazardous waste characteristics and there were no free liquids. Note that moisture content/paint filter test results may be different for drilling spoils generated during construction depending on the drilling methods used (particularly for drilling methods such as mud rotary or other methods that use water in the drilling process).

### **Soil Reuse and Disposal Options**

Soil reuse would be governed by the definitions of "clean fill" and "natural soil" in Connecticut's solid waste regulations (Regulations of Connecticut State Agencies, RCSA, Section 22a-209-1)<sup>3</sup>. The

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<sup>1</sup> From the Remediation Standard Regulations, Regulations of Connecticut State Agencies, Section 22a-133k-1 through 3.

<sup>2</sup> "Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria," CTDEEP, December 10, 2015, revised January 2017.

<sup>3</sup> RCSA Section 22a-209-1: "'Clean fill' means (1) natural soil (2) rock, brick, ceramics, concrete, and asphalt paving fragments which are virtually inert and pose neither a pollution threat to ground or surface waters nor a fire hazard and (3) polluted soil as defined in subdivision (45) of subsection (a) of section 22a-133k-1 of the Regulations of Connecticut State Agencies which soil has been treated to reduce the concentration of pollutants to levels which do not exceed the applicable pollutant mobility criteria



presence of even a trace concentration of PAHs, ETPH, DDT or DDE may preclude unrestricted reuse of these soils, unless further sampling is conducted and ‘polluted’ soils can be isolated from unpolluted soils. Alternatively, those slightly polluted soils may be suitable for on-site or off-site reuse under the conditions referenced in the definition of “clean fill” in the solid waste regulations and as described in RCSA Section 22a-133k-2(h)(3)<sup>4</sup>.

Analysis of these soil samples indicates that soil removed from this area would not meet the definition of a characteristic hazardous waste and there is no evidence to suggest that it would be a listed hazardous waste. Nonetheless, and as noted above, some slight impacts were detected in some samples. Soil such as this would be expected to be accepted at most landfills and disposal facilities, such as some of those listed below, and may be suitable to use as cover materials at some landfills.

<i>Location</i>	<i>Acceptance</i>	<i>Conditions/Comments</i>
Manchester Landfill, Manchester, Connecticut	Likely	Some debris acceptable if material is not to be used as cover material
Hamden Tire Pond, Hamden, Connecticut	Possible	Currently accepting soil for cover with restrictions on grain size and constituent concentrations
Becker’s Quarry, Willington, Connecticut	Likely	Additional metals analyses required (copper, nickel, zinc); some debris acceptable
Clean Earth of Connecticut (formerly Phoenix Soils, LLC), Plainville, Connecticut	Possible	ETPH concentrations may be too low for acceptance as petroleum-containing soil
Massachusetts Landfills (as per Policy # COMM-97-001)	Possible	Given the low level of impacts, the application may be rejected “if a cost effective alternative exists” (Policy #COMM-97-001, Section 4.4).

and direct exposure criteria established in sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies and which soil is reused in accordance with R.C.S.A. Subdivision (3) of Subsection (h) of Section 22a-133k-2 of such regulations.”

“Natural soil” means soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substance occurring naturally in the environment and in which soil no other substance is analytically detectable. For the purpose of this definition, substance shall have the same meaning as in Section 22a-133k-1 of the Regulations of Connecticut State Agencies.”

<sup>4</sup>(3) Polluted soil.

Polluted soil from a release area may be treated to achieve concentrations of substances that do not exceed either the applicable direct exposure criteria or pollutant mobility criteria. After such treatment, such soil may be reused on the parcel from which it was excavated or on another parcel approved by the Commissioner, provided that such reuse is consistent with all other provisions of Sections 22a-133k-1 through 22a-133k-3, inclusive, of the Regulations of Connecticut State Agencies and:

- (A) Prior to reuse, a map showing the location and depth of proposed placement of such soil is submitted to the Commissioner;
- (B) Such soil is not placed below the water table;
- (C) Such soil is not placed in an area subject to erosion; and
- (D) Any such soil in which the concentration of any substance exceeds the pollutant mobility criteria applicable to a GA area is not placed over soil and ground water which have not been affected by a release at the parcel at which placement is proposed; and
- (E) For soils polluted with PCB, the Commissioner has issued a written approval in accordance with by Section 22a-467 of the General Statutes.



Note that leachable metals by the Toxicity Characteristic Leaching Procedure (TCLP) is or may be required at some facilities. However, the total metals concentrations in the samples were consistent and sufficiently low that they theoretically could not fail the TCLP test for characteristic hazardous waste.

### Estimate of Soil Quantities

WSP's scope of services for this project includes preparing an estimate of the quantity of excess soil to be generated during construction. That estimate was based upon information provided in the 50% design drawings prepared by Desman, Inc. and others and dated February 28, 2019. That estimate is detailed in Attachment III.

### Groundwater Sample Analytical Data

The analytical results for the groundwater sample are summarized on table 3. The laboratory report is provided in Attachment II. VOCs, SVOCs and ETPH were not detected. Certain metals were detected in the filtered sample (some level of metals is naturally occurring), but the concentrations of the individual metals were less than the Groundwater Protection Criteria and Surface Water Protection Criteria. These groundwater sample analytical results showed no apparent evidence of impacts.

### Summary/Conclusions

In summary, four of the soil samples identified small impacts at concentrations less than the RDEC and GAPMC. Because of this, all of the soil may not strictly meet the definition of clean fill in the Connecticut solid waste regulations. However, given the very low constituent concentrations, it is likely that the material would be accepted for disposal at several Connecticut facilities.

Thank you for the opportunity to provide these services. Please contact Michael Susca at 475-882-1736 if you have any questions.

Kind Regards,

WSP USA

Michael Susca, CPG, LEP  
Supervising Hydrogeologist

Reviewed by:

Rob F. Good, Jr., PG, LEP  
Senior Supervising Hydrogeologist

MS:nv

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## **TABLES**

TABLE 1

CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES - CONSTRUCTION SERVICES  
 CENTRAL CONNECTICUT STATE UNIVERSITY  
 55 PAUL MANAFORT DRIVE  
 NEW BRITAIN, CONNECTICUT

Summary of Laboratory Analytical Results - Soil Samples

Sample ID	VOC	SVOC (ug/kg)		PCB (Soxhlet extr.) (mg/kg)	Metals (mg/kg)								ETPH (mg/kg)	Pesticides (ug/kg)		Herbicides	Waste Characterization Parameters							
		Fluoranthene	Pyrene		Silver	Arsenic	Barium	Cadmium	Total Chromium	Mercury	Lead	Selenium		4,4'-DDT	4,4'-DDE		Corrosivity	pH^^ (pH units)	Ignitability	Flashpoint (degrees Fahrenheit)	Reactivity	Reactive Cyanide (mg/kg)	Reactive Sulfides (mg/kg)	Paint Filter Test
Residential Direct Exposure Criteria	*	1,000,000	1,000,000	1 (total PCB)	340	10	4,700	34	100 (as Cr <sup>6+</sup> )	20	400	340	500	NE/1,800		*	NA	NA	NA	NA	NA	NA	NA	NA
Industrial/Commercial Direct Exposure Criteria	*	2,500,000	2,500,000	**	10,000	10	140,000	1,000	100 (as Cr <sup>6+</sup> )	610	1,000	10,000	2,500	NE/17,000		*	NA	NA	NA	NA	NA	NA	NA	NA
GA Pollutant Mobility Criteria	*	5,600	4,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	500	NE/3		*	NA	NA	NA	NA	NA	NA	NA	NA
B-4(1-5)	--	ND<280	ND<280	ND<0.39	ND<0.42	3.8	73.3	ND<0.42	20.4	ND<0.03	16.6	ND<1.7	120	ND<1.6	ND<1.6	ND	negative	8.1	passed	>200	negative	<6	<20	passed
B-4(4)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-5(1-5)	--	290	280	ND<0.39	ND<0.41	4.44	152	0.76	20	0.04	34.4	ND<1.6	97	ND<1.6	ND<1.6	ND	negative	8.24	passed	>200	negative	<6	<20	passed
B-5(4.5)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-5(5-35.5)	--	ND<280	ND<280	ND<0.39	ND<0.38	3.07	91	ND<0.38	18.6	ND<0.03	9.04	ND<1.5	ND<59	ND<1.6	ND<1.6	ND	negative	7.42	passed	>200	negative	<6	<20	passed
B-5(35)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-7(1-5)	--	ND<260	ND<260	ND<0.38	ND<0.38	4.43	85.5	0.41	21.3	ND<0.03	12.2	ND<1.5	69	18	28	ND	negative	8.54	passed	>200	negative	<6	<20	passed
B-7(2.5)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-8(1-5)	--	ND<250	ND<250	ND<0.37	ND<0.33	4.65	93.8	0.6	4.4	ND<0.03	22.1	ND<1.3	280	5.1	4.1	ND	negative	9.36	passed	>200	negative	<5	<20	passed
B-8(3.5)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-8(5-31.5)	--	ND<270	ND<270	ND<0.38	ND<0.39	7.12	98.8	0.48	20.4	ND<0.03	16.3	ND<1.6	ND<56	ND<1.5	ND<1.5	ND	negative	8.48	passed	>200	negative	<6	<20	passed
B-8(31.5)	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

VOC Volatile organic compounds  
 SVOC Semi-volatile organic compounds  
 PCB Polychlorinated biphenyls  
 ETPH Connecticut extractable total petroleum hydrocarbons  
 ND Not detected; reporting limits may vary with individual compound, none were detected  
 ND< Not detected above reporting limit indicated  
 -- Sample was not analyzed for this constituent  
 mg/kg milligrams per kilogram  
 ug/kg micrograms per kilogram  
 \* Criteria vary by compound  
 \*\* The industrial/commercial Direct Exposure Criterion for PCB of 10 mg/kg applies only under limited conditions that are not met at this site.  
 NA Criteria do not apply the results of this analysis.  
 ^ Reporting limit is for individual aroclors; none were detected  
 ^^ The holding time for pH is immediate, so all pH results may be considered out of holding time.

NE/xxx Criterion for this analyte is not established (NE) in the Remediation Standard Regulations (RSRs). Criteria from CTDEEP's "Technical Support Document: Recommended Numerical Criteria for Common Additional Polluting Substances and Certain Alternative Criteria," December 10, 2015 (revised January 27, 2017) are provided where criteria are not established in the 2013 RSRs, as these criteria are useful for comparison purposes in data evaluation. At this time, these criteria appear to be CTDEEP's default criteria, but use of these criteria are subject to site-specific approval. Criteria applies to all forms of 4,4'-DDT including DDD and DDE.

**TABLE 2**

**CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES - CONSTRUCTION SERVICES  
CENTRAL CONNECTICUT STATE UNIVERSITY  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CONNECTICUT**

**Summary of Laboratory Analytical Results - SPLP Extraction and Analysis on Selected Soil Samples**

Sample ID	SPLP Pesticides by Method 8081 (ug/L)	
	4,4'-DDT	4,4'-DDE
Groundwater Protection Criteria	NE/ 0.10 (applies to total)	
B-7(1-5)	ND<0.005	ND<0.005
B-8(1-5)	ND<0.005	ND<0.005

SPLP            Synthetic Precipitation Leaching Procedure  
 ND<            Not detected above reporting limit indicated  
 --              Sample was not analyzed for this constituent  
 ug/L            micrograms per liter  
 NE/xxx        Criterion for this analyte is not established (NE) in the Remediation Standard Regulations (RSRs). Criteria from CTDEEP's "Technical Support Document: Recommended Numerical Criteria for Common Additional Polluting Substances and Certain Alternative Criteria," December 10, 2015 (revised January 27, 2017) are provided where criteria are not established in the 2013 RSRs, as these criteria are useful for comparison purposes in data evaluation. At this time, these criteria appear to be CTDEEP's default criteria, but use of these criteria are subject to site-specific approval. Criterion applies to all forms of 4,4'-DDT including DDD and DDE.



TABLE 3

CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES - CONSTRUCTION SERVICES  
 CENTRAL CONNECTICUT STATE UNIVERSITY  
 55 PAUL MANAFORT DRIVE  
 NEW BRITAIN, CONNECTICUT

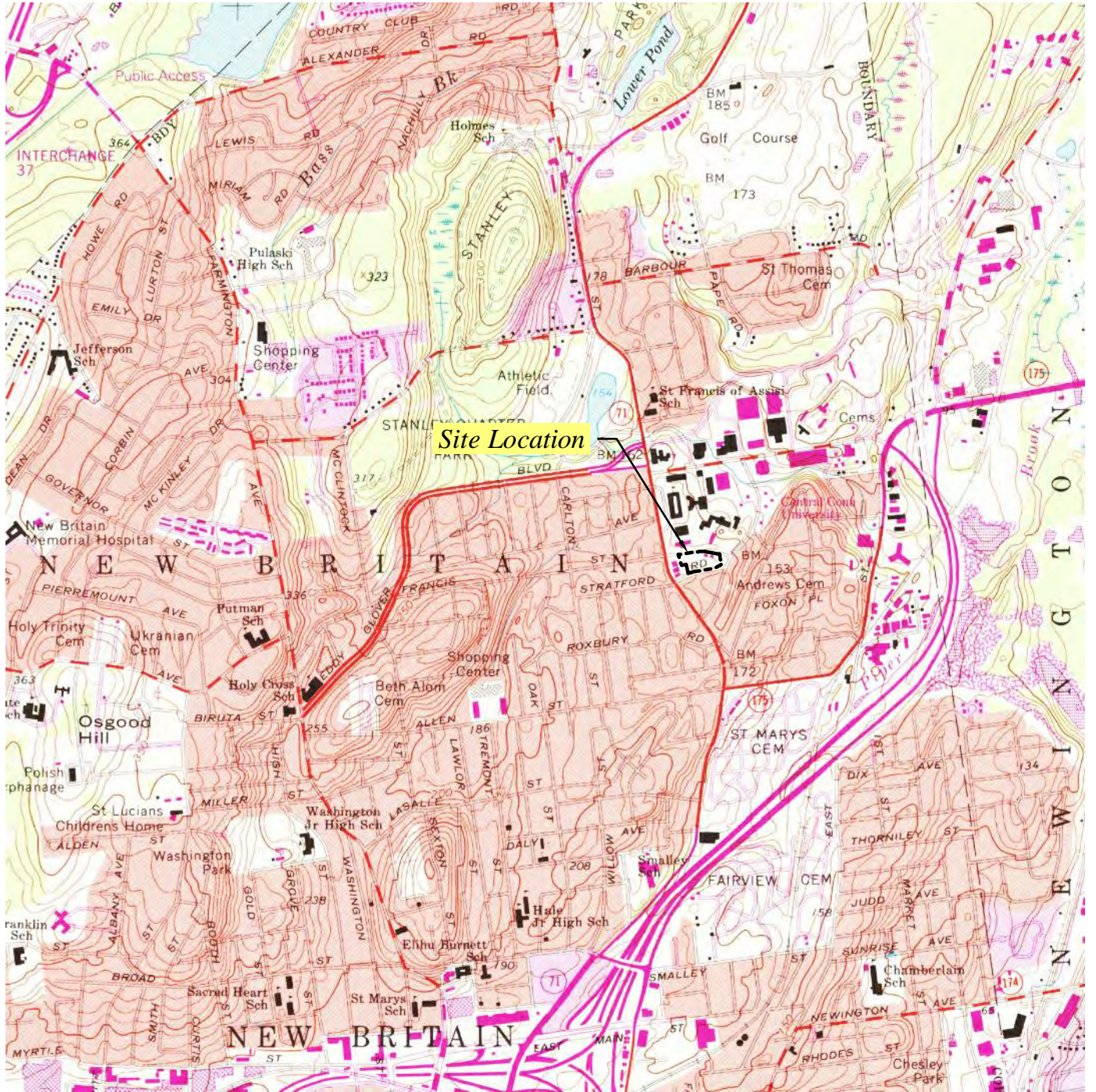
Summary of Laboratory Analytical Results - Groundwater Sample

Sample ID	VOC	SVOC	PCB (ug/L)	Dissolved/Filtered Metals (mg/L)								ETPH (mg/L)
				Silver	Arsenic	Barium	Cadmium	Total Chromium	Mercury	Lead	Selenium	
Groundwater Protection Criteria	*	*	0.5	0.036	0.05	1	0.005	0.05	0.002	0.015	0.05	0.25
Residential Groundwater Volatilization Criteria	*	*	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE/0.25
Surfacewater Protection Criteria	*	*	0.5	0.012	0.004	NE/	0.006	0.11 (Cr+6)	0.0004	0.013	0.05	NE/0.25
B-5	ND	ND	ND<0.47^	ND<0.001	ND<0.004	0.373	ND<0.001	0.002	ND<0.0002	ND<0.002	ND<0.010	ND<0.067

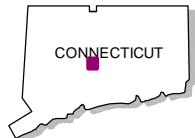
- VOC Volatile organic compounds
- SVOC Semi-volatile organic compounds
- PCB Polychlorinated biphenyls
- ETPH Connecticut extractable total petroleum hydrocarbons
- ND Not detected; reporting limits may vary with individual compound, none were detected
- ND< Not detected above reporting limit indicated
- mg/L milligrams per liter
- ug/L micrograms per liter
- \* Criteria vary by compound
- NE Criteria are not established for this analyte.
- ^ Reporting limit is for individual aroclors; none were detected
- NE/xxx Criterion for this analyte is not established (NE) in the Remediation Standard Regulations (RSRs). Criteria from CTDEEP's "Technical Support Document: Recommended Numerical Criteria for Common Additional Polluting Substances and Certain Alternative Criteria," December 10, 2015 (revised January 27, 2017) are provided where criteria are not established in the 2013 RSRs, as these criteria are useful for comparison purposes in data evaluation. At this time, these criteria appear to be CTDEEP's default criteria, but use of these criteria are subject to site-specific approval.



## FIGURES



SOURCE: USGS TOPOGRAPHIC QUADRANGLE NEW BRITAIN, CONNECTICUT (REVISED 1992).



QUADRANGLE LOCATION



CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES  
55 PAUL MANAFORT DRIVE  
NEW BRITAIN, CONNECTICUT

SITE LOCATION MAP

DATE	REVISED

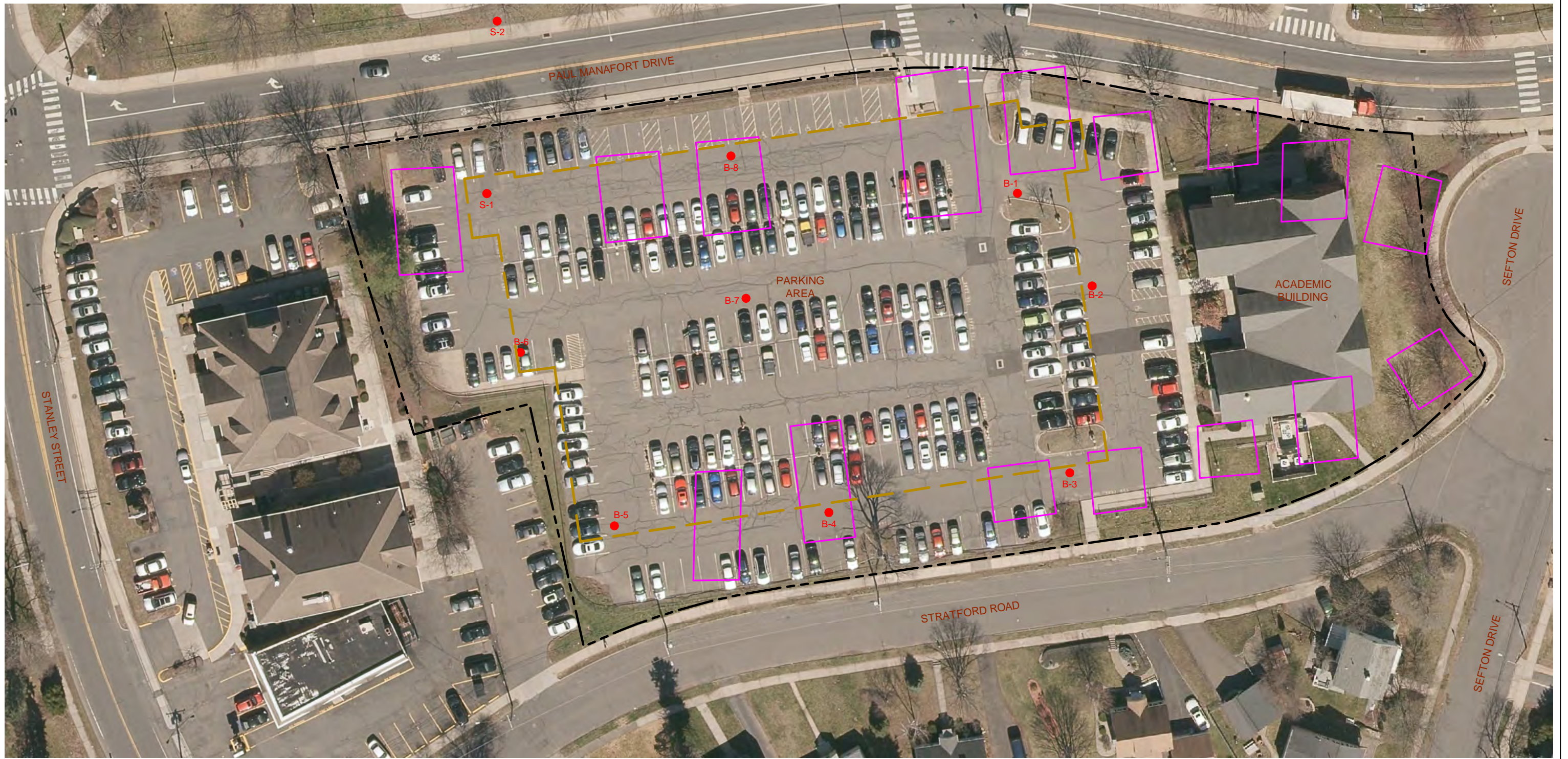


PREPARED BY:





WSP USA  
6 Executive Drive  
Suite 109  
Farmington, Connecticut 06032  
(860) 678-0404

<b>DRAWN:</b>	RAC	<b>CHECKED:</b>	MS	<b>DATE:</b>	09/21/18	<b>FIGURE:</b>	1
---------------	-----	-----------------	----	--------------	----------	----------------	---

O:\DWG\CT DAS\New Britain\55 Paul Manafort\55 Paul Manafort\F2\_BoringLoca.dwg, Layout1, 9/26/2018 8:02:12 AM, PDF.XChange for AcroPlot Pro




**LEGEND**

-  PROPERTY BOUNDARY
-  PREVIOUSLY DEMOLISHED BUILDING (APPROXIMATE LOCATION)
-  PRELIMINARY FOOTPRINT OF PROPOSED PARKING GARAGE
-  APPROXIMATE BORING LOCATION AND NUMBER



CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES  
 55 PAUL MANAFORT DRIVE  
 NEW BRITAIN, CONNECTICUT

**BORING LOCATION MAP**

DATE	REVISED	PREPARED BY:
		
		WSP USA 6 Executive Drive Suite 109 Farmington, Connecticut 06032 (860) 678-0404
<b>DRAWN:</b>	RAC	<b>CHECKED:</b> MS <b>DATE:</b> 09/26/18 <b>FIGURE:</b> 2



**ATTACHMENT I  
BORING LOGS**



**GEOLOGIC LOG**  
**WSP USA**  
**SHELTON, CONNECTICUT**

**OWNER: CT DAS**

**BORING NO: B-4**

**PAGE 1 OF 1 PAGE**

**SITE LOCATION:** 55 Paul Manafort Drive  
 New Britain, CT

**SCREEN SIZE & TYPE:** N/A      **SLOT NO:** N/A  
**SETTING:** N/A

**DATE COMPLETED:** 8/13/2018

**SAND PACK SIZE & TYPE:** N/A

**DRILLING COMPANY:** New England Boring Contractors

**SETTING:** N/A

**CASING SIZE & TYPE:** N/A

**DRILLING METHOD:** Hollow Stem Auger

**SETTING:** N/A

**SAMPLING METHOD:** Split Spoon

**SEAL TYPE:** N/A

**OBSERVER:** D. Mostowy

**SETTING:** N/A

**REFERENCE POINT (RP):** Grade

**BACKFILL TYPE:** Native

**ELEVATION OF RP:** ---

**STATIC WATER LEVEL:** N/A

**STICK-UP:** N/A

**DEVELOPMENT METHOD:** N/A

**SURFACE COMPLETION:** Asphalt Patch

**DURATION:** N/A      **YIELD:** N/A

**REMARKS:** (4) @ 1525; (1-5) @ 1530

**GPS COORDINATES:**

**ABBREVIATIONS:** SS = split spoon    W = wash    C = cuttings    G = grab    ST = shelby tube    REC = recovery    PPM = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
1	3	SS	-	2	0	SAND; fine to medium, little gravel, semi-compact, red-brown, dry
3	5	SS	-	2	0	Same as above
						Boring continued supervised by others.



**GEOLOGIC LOG**  
**WSP USA**  
**SHELTON, CONNECTICUT**

**OWNER: CTDAS**

**BORING NO: B-5**

**PAGE 1 OF 1 PAGE**

<b>SITE LOCATION:</b> 55 Paul Manafort Drive New Britain, CT	<b>SCREEN SIZE &amp; TYPE:</b> PVC Pre-pack <b>SLOT NO:</b> 0.010" <b>SETTING:</b> 33.5 to 23.5 ftbg
<b>DATE COMPLETED:</b> 8/13/2018	<b>SAND PACK SIZE &amp; TYPE:</b> No. 1 FilterPro
<b>DRILLING COMPANY:</b> New England Boring Contractors	<b>SETTING:</b> 33.5 to 21.5 ftbg
	<b>CASING SIZE &amp; TYPE:</b> 2" PVC Riser
<b>DRILLING METHOD:</b> Hollow Stem Auger	<b>SETTING:</b> 33.5 ftbg to Grade
<b>SAMPLING METHOD:</b> Split Spoon	<b>SEAL TYPE:</b> Bentonite
<b>OBSERVER:</b> D. Mostowy	<b>SETTING:</b> 3 to 2 ftbg
<b>REFERENCE POINT (RP):</b> Grade	<b>BACKFILL TYPE:</b> Native
<b>ELEVATION OF RP:</b> ---	<b>STATIC WATER LEVEL:</b> 15.32 ftbg
<b>STICK-UP:</b> N/A	<b>DEVELOPMENT METHOD:</b> Purge w/ Bailer
<b>SURFACE COMPLETION:</b> curb box in concrete	<b>DURATION:</b> 1 hr <b>YIELD:</b> 5 Gallons
<b>REMARKS:</b> (4.5) @ 0855; (1-5) @ 0900; (35) @ 1155; (5-35.5) @ 1200	
<b>GPS COORDINATES:</b>	
<b>ABBREVIATIONS:</b> SS = split spoon W = wash C = cuttings G = grab ST = shelly tube REC = recovery PPM = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
1	3	SS	-	2	0	SAND; medium to fine; some silt; trace of gravel; semi-compact; red-brown, dry
3	5	SS	-	2	0	Same as above
5	7	SS	-	1.5	0	Same as above w/ some clay
7	9	SS	-	1	0	Same as above but wet; construction debris (red brick) @ 8 ftbg
13	15	SS	-	1	0	SAND; medium; some silt; some clay; trace of gravel; semi-compact; red-brown; wet
18	20	SS	-	1.3	0	GRAVEL; coarse, angular w/ fractured rock
23	25	SS	-	0.5	0	SAND; medium to coarse, some gravel, little silt, trace of clay, semi-compact, red-brown, wet
28	30	SS	-	0.8	0	CLAY; red-brown; some silt and fractured rock
33	33.5	SS	-	0.5	0	BEDROCK; fractured; some clay; some silt; REFUSAL @ 33.5 ftbg EOB



**GEOLOGIC LOG**  
**WSP USA**  
**SHELTON, CONNECTICUT**

**OWNER: CT DAS**

**BORING NO: B-7**

**PAGE 1 OF 1 PAGE**

<b>SITE LOCATION:</b> 55 Paul Manafort Drive New Britain, CT	<b>SCREEN SIZE &amp; TYPE:</b> N/A <b>SLOT NO:</b> N/A <b>SETTING:</b> N/A
<b>DATE COMPLETED:</b> 8/13/2018	<b>SAND PACK SIZE &amp; TYPE:</b> N/A
<b>DRILLING COMPANY:</b> New England Boring Contractors	<b>SETTING:</b> N/A
<b>DRILLING METHOD:</b> Hollow Stem Auger	<b>CASING SIZE &amp; TYPE:</b> N/A <b>SETTING:</b> N/A
<b>SAMPLING METHOD:</b> Split Spoon	<b>SEAL TYPE:</b> N/A
<b>OBSERVER:</b> D. Mostowy	<b>SETTING:</b> N/A
<b>REFERENCE POINT (RP):</b> Grade	<b>BACKFILL TYPE:</b> Native
<b>ELEVATION OF RP:</b> ---	<b>STATIC WATER LEVEL:</b> N/A
<b>STICK-UP:</b> N/A	<b>DEVELOPMENT METHOD:</b> N/A
<b>SURFACE COMPLETION:</b> Asphalt Patch	<b>DURATION:</b> N/A <b>YIELD:</b> N/A
<b>REMARKS:</b> (2.5) @ 0900 (1-5) @ 0900	
<b>GPS COORDINATES:</b>	
<b>ABBREVIATIONS:</b> SS = split spoon    W = wash    C = cuttings    G = grab    ST = shelly tube    REC = recovery    PPM = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
1	3	SS	-	1.0	0.0	SAND; and silt, fine; little gravel, fine, sub-angular; red-brown; compact; dry
3	5	SS	-	0.9	0.0	SAND; and silt, fine; little gravel, fine, rounded; red-brown; compact; dry
						Boring continued, supervised by others





**GEOLOGIC LOG**  
**WSP USA**  
**SHELTON, CONNECTICUT**

**OWNER: CT DAS**

**BORING NO: B-8**

**PAGE 1 OF 1 PAGE**

**SITE LOCATION:** 55 Paul Manafort Drive  
 New Britain, CT

**SCREEN SIZE & TYPE:** N/A      **SLOT NO:** N/A  
**SETTING:** N/A

**DATE COMPLETED:** 8/13/2018 & 8/14/2018

**SAND PACK SIZE & TYPE:** N/A

**DRILLING COMPANY:** New England Boring Contractors

**SETTING:** N/A

**CASING SIZE & TYPE:** N/A

**DRILLING METHOD:** Hollow Stem Auger

**SETTING:** N/A

**SAMPLING METHOD:** Split Spoon

**SEAL TYPE:** N/A

**OBSERVER:** D. Mostowy

**SETTING:** N/A

**REFERENCE POINT (RP):** Grade

**BACKFILL TYPE:** Native

**ELEVATION OF RP:** ---

**STATIC WATER LEVEL:** N/A

**STICK-UP:** N/A

**DEVELOPMENT METHOD:** N/A

**SURFACE COMPLETION:** Asphalt Patch

**DURATION:** N/A      **YIELD:** N/A

**REMARKS:** (3.5) @ 8/13/2018 1455; (1-5) @ 8/13/2018 1500; (5-31.5) @ 8/14/2018 1130; (31.5) @ 8/14/2018 1135

**GPS COORDINATES:**

**ABBREVIATIONS:** SS = split spoon    W = wash    C = cuttings    G = grab    ST = shelby tube    REC = recovery    PPM = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
1	3	SS	-	2	0	SAND; medium to fine, trace of gravel, semi-compact, brown, moist; fill
3	5	SS	-	2	0	Same as above
5	7	SS	-	1.8	0	SAND; medium; trace of gravel, some silt, some clay, semi-compact, red-brown, wet
7	9	SS	-	1	0	Same as above
13	15	SS	-	1	0	Same as above
18	20	SS	-	1	0	Same as above
23	25	SS	-	1	0	SAND; medium, little gravel, some silt, little clay, semi-compact, red-brown, wet, angular fractured rock @ 23 – 23.5 ftbg
28	30	SS	-	0.8	0	SAND; medium, little gravel, little silt, some clay, semi-compact, red-brown, wet
33	35	SS	-	0.5	0	Same as above w/ fractured rock; EOB @ 35 ftbg



**ATTACHMENT II  
LABORATORY REPORTS**

ATTACHMENT II

CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES - CONSTRUCTION SERVICES  
CENTRAL CONNECTICUT STATE UNIVERSITY  
55 PAUL MAAFORT DRIVE  
NEW BRITAIN, CONNECTICUT

Laboratory Analytical Data Quality/Usability Evaluation Summary Table

Laboratory Report Number	Sample Numbers	Date Collected	Analyses Requested	Holding Times Met?	Temperature Acceptable on Receipt	COC Form Complete	Duplicate Performance	Conditions with "No" on Certification Form	Significant Quality Assurance Issues Noted by Laboratory in Narrative	Data Usability Evaluation
<b>Soil</b>										
BC10356	B-4(1-5), B-4(4), B-5(1-5), B-5(4.5), B-5(5-35.5), B-5(35), B-7(1-5), B-7(2.5), B-8(1-5), B-8(3.5)	8/13/2018	VOC M8260, SVOC M8270, PCB M8082, Pesticides M8081, herbicides M8051, metals (RCRA), CTETPH, corrosivity, ignitability, reactivity, paint filter test	Y except for pH	Y	Y	NA	4, 6, 7	pH considered out of holding time (holding time is immediate) LCS/LCSD RPD exceeded method criteria (dalapon); possible loss of precision. LCS/LCSD RPD exceeded method criteria (4,4'-DDD); possible loss of precision. LCS/LCSD recovery low (benzoic acid), low bias is likely. Low bias is possible for 2,4-dinitrophenol, 4,6-dinitrophenol, 2-methylphenol and pyridine. MS/MSD RPD exceeds method criteria (tetrahydrofuran), possible loss of precision.	Precision issues do not affect results as these compounds were not detected. pH holding time variance not regarded as significant. Data are considered useable for intended purpose.
BC11569	B-8(5-31.5), B-8(31.5)	8/14/2018	VOC M8260, SVOC M8270, PCB M8082, Pesticides M8081, herbicides M8051, metals (RCRA), CTETPH, corrosivity, ignitability, reactivity, paint filter test	Y except for pH	Y	Y	NA	4,6	pH considered out of holding time (holding time is immediate) LCS/LCSD RPD exceeded method criteria (dalapon); possible loss of precision. LCS/LCSD recovery low (benzidine and benzoic acid), low bias is likely. Low bias is possible for 2,4-dinitrophenol, 4,6-dinitrophenol, and 2-methylphenol.	Precision issues do not affect results as these compounds were not detected. pH holding time variance not regarded as significant. Data are considered useable for intended purpose.
CB10356	B-5(1-5), B-8(1-5)	8/13/2018	SPLP pesticides	Y	Y	NA	NA	4,6,7	None noted.	Data are considered usable for intended purpose.
<b>Groundwater</b>										
CB13749	B-5	8/17/2018	VOC M8260, SVOC M8270, PCB, metals (RCRA), CTETPH	Y	Y	Y (incorrect standards were cited)	NA	4,6,7	LCS/LCSD RPD exceeded method criteria (benzidine and pyridine); possible loss of precision.	Precision issues do not affect results as these compounds were not detected.

COC = chain of custody form

RCP = Reasonable Confidence Protocols

RCP Laboratory Certification Form - notes for "no" responses

- 1A - method specific preservation and/or holding time requirement was not met
- 4 - all QA/QC performance criteria were not achieved
- 5A - reporting limits were not specified on chain of custody form
- 5B - reporting limits specified were not met
- 6 - results were not reported for all constituents on method-specific analyte lists
- 7 - site-specific matrix spikes and duplicates were not included

NA = not applicable; field duplicate sample not collected

RPD = relative percent difference

LCS/LCSD = laboratory control sample/laboratory control sample duplicate

MS/MSD = matrix spike/matrix spike duplicate

CTETPH = Connecticut extractable total petroleum hydrocarbons

VOCs = volatile organic compounds, Method 8260

SVOC = semi-volatile organic compounds

SPLP = Synthetic Precipitation Leaching Procedure

ND = not detected, none detected

RL = reporting limit

RCRA = Resource Conservation and Recovery Act



Wednesday, August 22, 2018

Attn: Mike Susca  
WSP USA  
4 Research Dr Suite 204  
Shelton, CT 06484

Project ID: CT DAS-CCSU  
Sample ID#s: CB11569 - CB11570

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis/Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
UT Lab Registration #CT00007  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## SDG Comments

August 22, 2018

SDG I.D.: GCB11569

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### Metals Analysis:

The client requested a site specific list of elements which is shorter than the 6010 RCP list.



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 22, 2018

FOR: Attn: Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date

08/14/18  
 08/15/18

Time

11:30  
 12:29

## Laboratory Data

SDG ID: GCB11569  
 Phoenix ID: CB11569

Project ID: CT DAS-CCSU  
 Client ID: B-8 (5-31.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	1	08/16/18	EK	SW6010C
Arsenic	7.12	0.79	mg/Kg	1	08/16/18	EK	SW6010C
Barium	98.8	0.39	mg/Kg	1	08/16/18	EK	SW6010C
Cadmium	0.48	0.39	mg/Kg	1	08/16/18	EK	SW6010C
Chromium	20.4	0.39	mg/Kg	1	08/16/18	EK	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	08/16/18	RS	SW7471B
Lead	16.3	0.39	mg/Kg	1	08/16/18	EK	SW6010C
Selenium	< 1.6	1.6	mg/Kg	1	08/16/18	EK	SW6010C
Percent Solid	87		%		08/15/18	VS	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/15/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/17/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/17/18	Y	SW846-Ignit
pH at 25C - Soil	8.48	1.00	pH Units	1	08/15/18 22:40	O	SW9045
Reactivity Cyanide	< 6	6	mg/Kg	1	08/21/18	EG/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/21/18	EG/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/21/18	EG/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/15/18	AA/V	SW3545A
Soil Extraction for SVOA	Completed				08/15/18	JJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	AA/VCK	SW3545A
Mercury Digestion	Completed				08/16/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/15/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/15/18	C/D	SW8151A
Extraction for PCB	Completed				08/15/18	W/KD/VS/KI	SW3540C
Total Metals Digest	Completed				08/15/18	S/AG	SW3050B

**Chlorinated Herbicides**

2,4,5-T	ND	95	ug/Kg	10	08/16/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	95	ug/Kg	10	08/16/18	CW	SW8151A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2,4-D	ND	190	ug/Kg	10	08/16/18	CW	SW8151A
2,4-DB	ND	1900	ug/Kg	10	08/16/18	CW	SW8151A
Dalapon	ND	95	ug/Kg	10	08/16/18	CW	SW8151A
Dicamba	ND	95	ug/Kg	10	08/16/18	CW	SW8151A
Dichloroprop	ND	190	ug/Kg	10	08/16/18	CW	SW8151A
Dinoseb	ND	190	ug/Kg	10	08/16/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	116		%	10	08/16/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	ND	56	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	78		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1221	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1232	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1242	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1248	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1254	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1260	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1262	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1268	ND	380	ug/Kg	10	08/16/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	96		%	10	08/16/18	AW	30 - 150 %
% TCMX	87		%	10	08/16/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
4,4' -DDE	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
4,4' -DDT	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
a-BHC	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
Alachlor	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Aldrin	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
b-BHC	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
Chlordane	ND	38	ug/Kg	2	08/16/18	CW	SW8081B
d-BHC	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
Dieldrin	ND	3.8	ug/Kg	2	08/16/18	CW	SW8081B
Endosulfan I	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Endosulfan II	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Endosulfan sulfate	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Endrin	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Endrin aldehyde	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Endrin ketone	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
g-BHC	ND	1.5	ug/Kg	2	08/16/18	CW	SW8081B
Heptachlor	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Heptachlor epoxide	ND	7.6	ug/Kg	2	08/16/18	CW	SW8081B
Methoxychlor	ND	38	ug/Kg	2	08/16/18	CW	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Toxaphene	ND	150	ug/Kg	2	08/16/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	82		%	2	08/16/18	CW	30 - 150 %
% TCMX	76		%	2	08/16/18	CW	30 - 150 %
<b><u>Semivolatiles</u></b>							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/16/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
1,2-Dichlorobenzene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
1,3-Dichlorobenzene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
1,4-Dichlorobenzene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
2,4-Dichlorophenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2,4-Dimethylphenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/16/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
2-Chloronaphthalene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2-Chlorophenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2-Methylnaphthalene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/16/18	HM	SW8270D
2-Nitrophenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	380	ug/Kg	1	08/16/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/16/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/16/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	380	ug/Kg	1	08/16/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/16/18	HM	SW8270D
4-Nitrophenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Acenaphthene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Acenaphthylene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Acetophenone	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Anthracene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benz(a)anthracene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Benzo(a)pyrene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benzo(b)fluoranthene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benzo(ghi)perylene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benzo(k)fluoranthene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Benzoic acid	ND	760	ug/Kg	1	08/16/18	HM	SW8270D
Benzyl butyl phthalate	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	380	ug/Kg	1	08/16/18	HM	SW8270D



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Bis(2-chloroisopropyl)ether	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Chrysene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Diethyl phthalate	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Dimethylphthalate	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Di-n-butylphthalate	ND	380	ug/Kg	1	08/16/18	HM	SW8270D
Di-n-octylphthalate	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Fluoranthene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Fluorene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Hexachlorobenzene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Hexachloroethane	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Isophorone	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Naphthalene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/16/18	HM	SW8270D
Pentachlorophenol	ND	380	ug/Kg	1	08/16/18	HM	SW8270D
Phenanthrene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Phenol	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Pyrene	ND	270	ug/Kg	1	08/16/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/16/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	74		%	1	08/16/18	HM	30 - 130 %
% 2-Fluorobiphenyl	73		%	1	08/16/18	HM	30 - 130 %
% 2-Fluorophenol	54		%	1	08/16/18	HM	30 - 130 %
% Nitrobenzene-d5	58		%	1	08/16/18	HM	30 - 130 %
% Phenol-d5	62		%	1	08/16/18	HM	30 - 130 %
% Terphenyl-d14	49		%	1	08/16/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

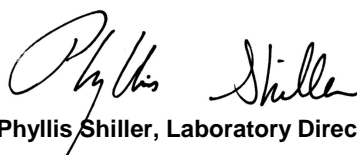
**Semi-Volatile Comment:**

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 22, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 22, 2018

FOR: Attn: Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

## Date

08/14/18  
 08/15/18

## Time

11:35  
 12:29

## Laboratory Data

SDG ID: GCB11569  
 Phoenix ID: CB11570

Project ID: CT DAS-CCSU  
 Client ID: B-8 (31.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	85		%		08/15/18	VS	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	2.4	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	20	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	20	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	200	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	2.4	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	24	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	8.1	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	8.1	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	8.1	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	8.1	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	4.1	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	100		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	89		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	95		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	96		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/14/18		SW5035A

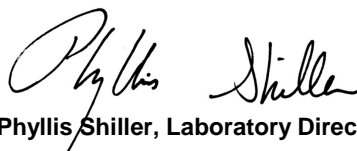
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 22, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
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# QA/QC Report

August 22, 2018

## QA/QC Data

SDG I.D.: GCB11569

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443265 (mg/kg), QC Sample No: CB11569 (CB11569)													
<u>ICP Metals - Soil</u>													
Arsenic	BRL	0.68	7.12	7.18	0.80	92.6			86.4			75 - 125	30
Barium	BRL	0.34	98.8	100	1.20	101			95.3			75 - 125	30
Cadmium	BRL	0.34	0.48	0.50	NC	95.0			84.3			75 - 125	30
Chromium	BRL	0.34	20.4	20.1	1.50	101			94.1			75 - 125	30
Lead	BRL	0.34	16.3	13.4	19.5	94.8			88.2			75 - 125	30
Selenium	BRL	1.4	<1.6	<1.4	NC	78.9			75.5			75 - 125	30
Silver	BRL	0.34	<0.39	<0.35	NC	101			96.9			75 - 125	30
QA/QC Batch 443444 (mg/kg), QC Sample No: CB12148 (CB11569)													
Mercury - Soil	BRL	0.02	0.22	0.25	12.8	105	100	4.9	111			70 - 130	30
Comment:													
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.													



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# QA/QC Report

August 22, 2018

## QA/QC Data

SDG I.D.: GCB11569

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443727 (Degree F), QC Sample No: CB11016 (CB11569)													
Flash Point			>200	>200	NC	100						75 - 125	30
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 443435 (PH), QC Sample No: CB11419 (CB11569)													
pH at 25C - Soil			9.37	9.31	0.60	100						85 - 115	20
QA/QC Batch 444056 (mg/Kg), QC Sample No: CB15111 5X (CB11569)													
Reactivity Cyanide	BRL	0.05	<6	<5.6	NC	99.8						85 - 115	30



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# QA/QC Report

August 22, 2018

## QA/QC Data

SDG I.D.: GCB11569

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443213 (ug/kg), QC Sample No: CB10817 (CB11569)										
<b>Semivolatiles - Soil</b>										
1,2,4,5-Tetrachlorobenzene	ND	230	66	62	6.3	61	57	6.8	30 - 130	30
1,2,4-Trichlorobenzene	ND	230	61	57	6.8	59	57	3.4	30 - 130	30
1,2-Dichlorobenzene	ND	180	59	55	7.0	61	59	3.3	30 - 130	30
1,2-Diphenylhydrazine	ND	230	73	71	2.8	66	58	12.9	30 - 130	30
1,3-Dichlorobenzene	ND	230	55	50	9.5	55	54	1.8	30 - 130	30
1,4-Dichlorobenzene	ND	230	56	52	7.4	58	50	14.8	30 - 130	30
2,4,5-Trichlorophenol	ND	230	81	78	3.8	73	66	10.1	30 - 130	30
2,4,6-Trichlorophenol	ND	130	75	72	4.1	70	65	7.4	30 - 130	30
2,4-Dichlorophenol	ND	130	71	66	7.3	64	51	22.6	30 - 130	30
2,4-Dimethylphenol	ND	230	71	68	4.3	68	54	23.0	30 - 130	30
2,4-Dinitrophenol	ND	230	<10	<10	NC	48	50	4.1	30 - 130	30
2,4-Dinitrotoluene	ND	130	81	78	3.8	76	69	9.7	30 - 130	30
2,6-Dinitrotoluene	ND	130	79	76	3.9	73	67	8.6	30 - 130	30
2-Chloronaphthalene	ND	230	72	70	2.8	69	63	9.1	30 - 130	30
2-Chlorophenol	ND	230	65	60	8.0	61	49	21.8	30 - 130	30
2-Methylnaphthalene	ND	230	63	59	6.6	60	56	6.9	30 - 130	30
2-Methylphenol (o-cresol)	ND	230	41	38	7.6	35	20	54.5	30 - 130	30
2-Nitroaniline	ND	330	119	117	1.7	105	95	10.0	30 - 130	30
2-Nitrophenol	ND	230	63	57	10.0	60	52	14.3	30 - 130	30
3&4-Methylphenol (m&p-cresol)	ND	230	69	66	4.4	64	43	39.3	30 - 130	30
3,3'-Dichlorobenzidine	ND	130	87	84	3.5	80	72	10.5	30 - 130	30
3-Nitroaniline	ND	330	92	88	4.4	79	70	12.1	30 - 130	30
4,6-Dinitro-2-methylphenol	ND	230	16	15	6.5	72	67	7.2	30 - 130	30
4-Bromophenyl phenyl ether	ND	230	75	74	1.3	72	65	10.2	30 - 130	30
4-Chloro-3-methylphenol	ND	230	72	70	2.8	65	59	9.7	30 - 130	30
4-Chloroaniline	ND	230	66	63	4.7	49	43	13.0	30 - 130	30
4-Chlorophenyl phenyl ether	ND	230	80	77	3.8	75	68	9.8	30 - 130	30
4-Nitroaniline	ND	230	78	74	5.3	72	65	10.2	30 - 130	30
4-Nitrophenol	ND	230	77	72	6.7	77	63	20.0	30 - 130	30
Acenaphthene	ND	230	74	70	5.6	72	67	7.2	30 - 130	30
Acenaphthylene	ND	130	70	68	2.9	67	61	9.4	30 - 130	30
Acetophenone	ND	230	57	53	7.3	58	48	18.9	30 - 130	30
Aniline	ND	330	53	47	12.0	32	28	13.3	30 - 130	30
Anthracene	ND	230	72	73	1.4	72	65	10.2	30 - 130	30
Benz(a)anthracene	ND	230	74	72	2.7	70	61	13.7	30 - 130	30
Benzidine	ND	330	30	29	3.4	24	21	13.3	30 - 130	30
Benzo(a)pyrene	ND	130	74	73	1.4	72	63	13.3	30 - 130	30
Benzo(b)fluoranthene	ND	160	78	76	2.6	76	67	12.6	30 - 130	30
Benzo(ghi)perylene	ND	230	72	74	2.7	63	53	17.2	30 - 130	30
Benzo(k)fluoranthene	ND	230	84	86	2.4	87	73	17.5	30 - 130	30
Benzoic Acid	ND	330	<10	<10	NC	22	21	4.7	30 - 130	30



## QA/QC Data

SDG I.D.: GCB11569

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Benzyl butyl phthalate	ND	230	82	80	2.5	83	72	14.2	30 - 130	30
Bis(2-chloroethoxy)methane	ND	230	67	63	6.2	62	52	17.5	30 - 130	30
Bis(2-chloroethyl)ether	ND	130	57	52	9.2	55	44	22.2	30 - 130	30
Bis(2-chloroisopropyl)ether	ND	230	58	53	9.0	57	52	9.2	30 - 130	30
Bis(2-ethylhexyl)phthalate	ND	230	85	81	4.8	85	79	7.3	30 - 130	30
Carbazole	ND	230	79	81	2.5	76	67	12.6	30 - 130	30
Chrysene	ND	230	78	75	3.9	74	64	14.5	30 - 130	30
Dibenz(a,h)anthracene	ND	130	75	78	3.9	67	58	14.4	30 - 130	30
Dibenzofuran	ND	230	72	70	2.8	68	63	7.6	30 - 130	30
Diethyl phthalate	ND	230	76	75	1.3	74	65	12.9	30 - 130	30
Dimethylphthalate	ND	230	76	75	1.3	72	66	8.7	30 - 130	30
Di-n-butylphthalate	ND	670	76	76	0.0	74	66	11.4	30 - 130	30
Di-n-octylphthalate	ND	230	78	79	1.3	74	65	12.9	30 - 130	30
Fluoranthene	ND	230	72	72	0.0	70	64	9.0	30 - 130	30
Fluorene	ND	230	73	72	1.4	71	64	10.4	30 - 130	30
Hexachlorobenzene	ND	130	72	72	0.0	70	63	10.5	30 - 130	30
Hexachlorobutadiene	ND	230	62	57	8.4	60	58	3.4	30 - 130	30
Hexachlorocyclopentadiene	ND	230	55	52	5.6	37	21	55.2	30 - 130	30 m,r
Hexachloroethane	ND	130	54	50	7.7	55	51	7.5	30 - 130	30
Indeno(1,2,3-cd)pyrene	ND	230	73	75	2.7	64	55	15.1	30 - 130	30
Isophorone	ND	130	59	55	7.0	56	48	15.4	30 - 130	30
Naphthalene	ND	230	62	58	6.7	61	53	14.0	30 - 130	30
Nitrobenzene	ND	130	64	59	8.1	62	53	15.7	30 - 130	30
N-Nitrosodimethylamine	ND	230	51	47	8.2	55	39	34.0	30 - 130	30 r
N-Nitrosodi-n-propylamine	ND	130	68	65	4.5	66	53	21.8	30 - 130	30
N-Nitrosodiphenylamine	ND	130	79	77	2.6	75	67	11.3	30 - 130	30
Pentachloronitrobenzene	ND	230	72	71	1.4	67	61	9.4	30 - 130	30
Pentachlorophenol	ND	230	52	46	12.2	67	61	9.4	30 - 130	30
Phenanthrene	ND	130	73	71	2.8	73	64	13.1	30 - 130	30
Phenol	ND	230	66	62	6.3	61	<10	NC	30 - 130	30 m
Pyrene	ND	230	73	73	0.0	70	64	9.0	30 - 130	30
Pyridine	ND	230	39	35	10.8	37	35	5.6	30 - 130	30
% 2,4,6-Tribromophenol	39	%	65	65	0.0	66	57	14.6	30 - 130	30
% 2-Fluorobiphenyl	44	%	67	64	4.6	63	58	8.3	30 - 130	30
% 2-Fluorophenol	31	%	55	50	9.5	52	41	23.7	30 - 130	30
% Nitrobenzene-d5	33	%	58	53	9.0	56	52	7.4	30 - 130	30
% Phenol-d5	36	%	63	57	10.0	56	<10	NC	30 - 130	30 m
% Terphenyl-d14	51	%	66	66	0.0	64	59	8.1	30 - 130	30

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 443262 (ug/Kg), QC Sample No: CB11325 10X (CB11569)

### Chlorinated Herbicides - Soil

2,4,5-T	ND	83	84	87	3.5	63	67	6.2	40 - 140	30
2,4,5-TP (Silvex)	ND	83	88	86	2.3	65	70	7.4	40 - 140	30
2,4-D	ND	170	77	76	1.3	46	48	4.3	40 - 140	30
2,4-DB	ND	1700	91	90	1.1	80	90	11.8	40 - 140	30
Dalapon	ND	83	31	44	34.7	126	120	4.9	40 - 140	30 l,r
Dicamba	ND	83	86	83	3.6	46	50	8.3	40 - 140	30
Dichloroprop	ND	170	102	105	2.9	78	82	5.0	40 - 140	30
Dinoseb	ND	170	77	76	1.3	74	85	13.8	40 - 140	30
% DCAA (Surrogate Rec)	119	%	122	126	3.2	95	101	6.1	30 - 150	30

## QA/QC Data

SDG I.D.: GCB11569

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
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QA/QC Batch 443280 (ug/Kg), QC Sample No: CB11405 10X (CB11569)

### Polychlorinated Biphenyls - Soil

PCB-1016	ND	170	78	75	3.9	52	49	5.9	40 - 140	30
PCB-1221	ND	170							40 - 140	30
PCB-1232	ND	170							40 - 140	30
PCB-1242	ND	170							40 - 140	30
PCB-1248	ND	170							40 - 140	30
PCB-1254	ND	170							40 - 140	30
PCB-1260	ND	170	85	83	2.4	63	57	10.0	40 - 140	30
PCB-1262	ND	170							40 - 140	30
PCB-1268	ND	170							40 - 140	30
% DCBP (Surrogate Rec)	103	%	106	103	2.9	80	72	10.5	30 - 150	30
% TCMX (Surrogate Rec)	76	%	96	99	3.1	61	62	1.6	30 - 150	30

QA/QC Batch 443255 (mg/Kg), QC Sample No: CB11563 (CB11569)

### TPH by GC (Extractable Products) - Soil

Ext. Petroleum H.C. (C9-C36)	ND	50	81	73	10.4	76	84	10.0	60 - 120	30
% n-Pentacosane	46	%	77	71	8.1	76	79	3.9	50 - 150	30

Comment:

Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

QA/QC Batch 443585 (ug/kg), QC Sample No: CB11571 (CB11570)

### Volatiles - Soil

1,1,1,2-Tetrachloroethane	ND	5.0	106	103	2.9	101	98	3.0	70 - 130	30
1,1,1-Trichloroethane	ND	5.0	106	106	0.0	97	98	1.0	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	3.0	107	110	2.8	98	98	0.0	70 - 130	30
1,1,2-Trichloroethane	ND	5.0	97	98	1.0	93	92	1.1	70 - 130	30
1,1-Dichloroethane	ND	5.0	109	108	0.9	104	104	0.0	70 - 130	30
1,1-Dichloroethene	ND	5.0	112	113	0.9	105	104	1.0	70 - 130	30
1,1-Dichloropropene	ND	5.0	104	105	1.0	97	96	1.0	70 - 130	30
1,2,3-Trichlorobenzene	ND	5.0	98	100	2.0	85	87	2.3	70 - 130	30
1,2,3-Trichloropropane	ND	5.0	94	98	4.2	96	94	2.1	70 - 130	30
1,2,4-Trichlorobenzene	ND	5.0	99	99	0.0	86	88	2.3	70 - 130	30
1,2,4-Trimethylbenzene	ND	1.0	103	102	1.0	96	96	0.0	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	5.0	96	102	6.1	92	90	2.2	70 - 130	30
1,2-Dibromoethane	ND	5.0	101	101	0.0	97	96	1.0	70 - 130	30
1,2-Dichlorobenzene	ND	5.0	104	104	0.0	96	97	1.0	70 - 130	30
1,2-Dichloroethane	ND	5.0	93	92	1.1	87	88	1.1	70 - 130	30
1,2-Dichloropropane	ND	5.0	98	96	2.1	92	91	1.1	70 - 130	30
1,3,5-Trimethylbenzene	ND	1.0	108	107	0.9	99	99	0.0	70 - 130	30
1,3-Dichlorobenzene	ND	5.0	105	104	1.0	96	97	1.0	70 - 130	30
1,3-Dichloropropane	ND	5.0	97	96	1.0	93	93	0.0	70 - 130	30
1,4-Dichlorobenzene	ND	5.0	103	100	3.0	95	94	1.1	70 - 130	30
2,2-Dichloropropane	ND	5.0	112	114	1.8	101	100	1.0	70 - 130	30
2-Chlorotoluene	ND	5.0	105	106	0.9	98	98	0.0	70 - 130	30
2-Hexanone	ND	25	73	77	5.3	70	69	1.4	70 - 130	30
2-Isopropyltoluene	ND	5.0	104	104	0.0	95	96	1.0	70 - 130	30
4-Chlorotoluene	ND	5.0	104	102	1.9	96	96	0.0	70 - 130	30
4-Methyl-2-pentanone	ND	25	82	86	4.8	80	80	0.0	70 - 130	30
Acetone	ND	10	79	84	6.1	97	99	2.0	70 - 130	30
Acrylonitrile	ND	5.0	91	96	5.3	85	86	1.2	70 - 130	30
Benzene	ND	1.0	99	98	1.0	92	91	1.1	70 - 130	30

QA/QC Data

SDG I.D.: GCB11569

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Bromobenzene	ND	5.0	102	101	1.0	96	95	1.0	70 - 130	30
Bromochloromethane	ND	5.0	107	106	0.9	100	101	1.0	70 - 130	30
Bromodichloromethane	ND	5.0	101	100	1.0	95	95	0.0	70 - 130	30
Bromoform	ND	5.0	113	112	0.9	106	105	0.9	70 - 130	30
Bromomethane	ND	5.0	115	108	6.3	107	109	1.9	70 - 130	30
Carbon Disulfide	ND	5.0	110	110	0.0	102	102	0.0	70 - 130	30
Carbon tetrachloride	ND	5.0	106	104	1.9	97	97	0.0	70 - 130	30
Chlorobenzene	ND	5.0	106	103	2.9	99	99	0.0	70 - 130	30
Chloroethane	ND	5.0	109	105	3.7	101	101	0.0	70 - 130	30
Chloroform	ND	5.0	104	104	0.0	98	98	0.0	70 - 130	30
Chloromethane	ND	5.0	97	97	0.0	87	88	1.1	70 - 130	30
cis-1,2-Dichloroethene	ND	5.0	99	94	5.2	91	97	6.4	70 - 130	30
cis-1,3-Dichloropropene	ND	5.0	96	96	0.0	89	90	1.1	70 - 130	30
Dibromochloromethane	ND	3.0	109	110	0.9	104	104	0.0	70 - 130	30
Dibromomethane	ND	5.0	98	100	2.0	95	93	2.1	70 - 130	30
Dichlorodifluoromethane	ND	5.0	127	127	0.0	112	111	0.9	70 - 130	30
Ethylbenzene	ND	1.0	105	102	2.9	97	97	0.0	70 - 130	30
Hexachlorobutadiene	ND	5.0	109	108	0.9	87	88	1.1	70 - 130	30
Isopropylbenzene	ND	1.0	107	107	0.0	98	100	2.0	70 - 130	30
m&p-Xylene	ND	2.0	108	104	3.8	98	99	1.0	70 - 130	30
Methyl ethyl ketone	ND	5.0	79	87	9.6	77	79	2.6	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	1.0	98	102	4.0	100	100	0.0	70 - 130	30
Methylene chloride	ND	5.0	96	96	0.0	105	105	0.0	70 - 130	30
Naphthalene	ND	5.0	100	103	3.0	89	92	3.3	70 - 130	30
n-Butylbenzene	ND	1.0	113	111	1.8	100	101	1.0	70 - 130	30
n-Propylbenzene	ND	1.0	109	107	1.9	100	100	0.0	70 - 130	30
o-Xylene	ND	2.0	105	102	2.9	96	96	0.0	70 - 130	30
p-Isopropyltoluene	ND	1.0	111	109	1.8	99	100	1.0	70 - 130	30
sec-Butylbenzene	ND	1.0	117	116	0.9	106	106	0.0	70 - 130	30
Styrene	ND	5.0	108	104	3.8	100	99	1.0	70 - 130	30
tert-Butylbenzene	ND	1.0	108	106	1.9	97	97	0.0	70 - 130	30
Tetrachloroethene	ND	5.0	104	101	2.9	94	93	1.1	70 - 130	30
Tetrahydrofuran (THF)	ND	5.0	85	93	9.0	82	83	1.2	70 - 130	30
Toluene	ND	1.0	98	97	1.0	91	90	1.1	70 - 130	30
trans-1,2-Dichloroethene	ND	5.0	110	110	0.0	104	104	0.0	70 - 130	30
trans-1,3-Dichloropropene	ND	5.0	94	96	2.1	88	86	2.3	70 - 130	30
trans-1,4-dichloro-2-butene	ND	5.0	108	113	4.5	96	94	2.1	70 - 130	30
Trichloroethene	ND	5.0	105	103	1.9	101	101	0.0	70 - 130	30
Trichlorofluoromethane	ND	5.0	112	108	3.6	103	103	0.0	70 - 130	30
Trichlorotrifluoroethane	ND	5.0	112	116	3.5	106	107	0.9	70 - 130	30
Vinyl chloride	ND	5.0	109	107	1.9	100	100	0.0	70 - 130	30
% 1,2-dichlorobenzene-d4	102	%	99	102	3.0	100	101	1.0	70 - 130	30
% Bromofluorobenzene	90	%	93	93	0.0	93	94	1.1	70 - 130	30
% Dibromofluoromethane	97	%	97	99	2.0	96	96	0.0	70 - 130	30
% Toluene-d8	96	%	94	94	0.0	94	95	1.1	70 - 130	30

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 443254 (ug/Kg), QC Sample No: CB12510 2X (CB11569)

Pesticides - Soil

4,4' -DDD	ND	1.7	82			52	58	10.9	40 - 140	30
4,4' -DDE	ND	1.7	81			53	60	12.4	40 - 140	30
4,4' -DDT	ND	1.7	80			57	71	21.9	40 - 140	30

QA/QC Data

SDG I.D.: GCB11569

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
a-BHC	ND	1.0	77			46	48	4.3	40 - 140	30
Alachlor	ND	3.3	NA			NA	NA	NC	40 - 140	30
Aldrin	ND	1.0	83			53	52	1.9	40 - 140	30
b-BHC	ND	1.0	82			56	59	5.2	40 - 140	30
Chlordane	ND	33	86			54	59	8.8	40 - 140	30
d-BHC	ND	3.3	85			47	49	4.2	40 - 140	30
Dieldrin	ND	1.0	79			52	59	12.6	40 - 140	30
Endosulfan I	ND	3.3	77			53	63	17.2	40 - 140	30
Endosulfan II	ND	3.3	79			63	68	7.6	40 - 140	30
Endosulfan sulfate	ND	3.3	80			51	69	30.0	40 - 140	30
Endrin	ND	3.3	87			58	64	9.8	40 - 140	30
Endrin aldehyde	ND	3.3	68			47	55	15.7	40 - 140	30
Endrin ketone	ND	3.3	81			52	57	9.2	40 - 140	30
g-BHC	ND	1.0	75			48	64	28.6	40 - 140	30
Heptachlor	ND	3.3	71			46	47	2.2	40 - 140	30
Heptachlor epoxide	ND	3.3	92			52	59	12.6	40 - 140	30
Methoxychlor	ND	3.3	79			52	57	9.2	40 - 140	30
Toxaphene	ND	130	NA			NA	NA	NC	40 - 140	30
% DCBP	93	%	87			65	72	10.2	30 - 150	30
% TCMX	89	%	78			53	54	1.9	30 - 150	30


Comment:

The QC for this batch consists of a Blank, LCS, MS, and MSD.

- l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
- m = This parameter is outside laboratory MS/MSD specified recovery limits.
- r = This parameter is outside laboratory RPD specified recovery limits.
- s = This parameter is outside laboratory Blank Surrogate specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 August 22, 2018

Wednesday, August 22, 2018

Criteria: CT: GAM, RC

State: CT

## Sample Criteria Exceedances Report

GCB11569 - WSP-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
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\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



## REASONABLE CONFIDENCE PROTOCOL LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

**Laboratory Name:** Phoenix Environmental Labs, Inc.

**Client:** WSP USA

**Project Location:** CT DAS-CCSU

**Project Number:**

**Laboratory Sample ID(s):** CB11569, CB11570

**Sampling Date(s):** 8/14/2018

**List RCP Methods Used (e.g., 8260, 8270, et cetera)** 6010, 7470/7471, 8081, 8082, 8151, 8260, 8270, ETPH

<b>1</b>	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>1A</b>	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>1B</b>	<u><i>YPH and EPH methods only:</i></u> Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<b>2</b>	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>3</b>	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<b>4</b>	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? See Sections: Herbicide Narration, SVOA Narration.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>5</b>	a) Were reporting limits specified or referenced on the chain-of-custody?  b) Were these reporting limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>6</b>	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>7</b>	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

**Authorized Signature:**  **Position:** Project Manager

**Printed Name:** Maryam Taylor **Date:** Wednesday, August 22, 2018

**Name of Laboratory** Phoenix Environmental Labs, Inc.

**This certification form is to be used for RCP methods only.**



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## RCP Certification Report

August 22, 2018

SDG I.D.: GCB11569

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### SDG Comments

Metals Analysis:

The client requested a site specific list of elements which is shorter than the 6010 RCP list.

### Cyanide Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### Instrument:

LACHAT 08/21/18-1

Dustin Harrison, Greg Danielewski, Chemist 08/21/18

CB11569

The samples were distilled in accordance with the method.

The initial calibration met criteria.

The calibration check standards (ICV,CCV) were within 15% of true value and were analyzed at a frequency of one per ten samples.

The continuing calibration blanks (ICB,CCB) had concentrations less than the reporting level.

The method blank, laboratory control sample (LCS), and matrix spike were distilled with the samples.

#### QC (Batch Specific):

Batch 444056 (CB15111)

CB11569

All LCS recoveries were within 80 - 120 with the following exceptions: None.

Additional: LCS acceptance range is 80-120% for soils MS acceptance range 75-125% for soils

### ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### Instrument:

AU-XL2 08/15/18-1

Jeff Bucko, Chemist 08/15/18

CB11569

The initial calibration (ETPH814I) RSD for the compound list was less than 30% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

#### QC (Batch Specific):

Batch 443255 (CB11563)

CB11569

All LCS recoveries were within 60 - 120 with the following exceptions: None.

All LCSD recoveries were within 60 - 120 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

### Herbicide Narration

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## RCP Certification Report

August 22, 2018

SDG I.D.: GCB11569

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### ***Herbicide Narration***

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443262 (Samples: CB11569): -----**

**The LCS and/or the LCSD recovery is below the method criteria. A low bias for these analytes is possible. (Dalapon)**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Dalapon)**

#### **Instrument:**

**AU-ECD12 08/16/18-1** Carol Wohlmuth, Chemist 08/16/18

CB11569

The initial calibration (HRB807AI) RSD for the compound list was less than 20% except for the following compounds: None.  
The initial calibration (HRB807BI) RSD for the compound list was less than 20% except for the following compounds: None.  
The continuing calibration %D for the compound list was less than 15% except for the following compounds:None.

#### **QC (Batch Specific):**

**Batch 443262 (CB11325)**

CB11569

All LCS recoveries were within 40 - 140 with the following exceptions: Dalapon(31%)  
All LCSD recoveries were within 40 - 140 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 30% with the following exceptions: Dalapon(34.7%)

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### ***Mercury Narration***

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### **Instrument:**

**MERLIN 08/16/18 08:43** Rick Schweitzer, Chemist 08/16/18

CB11569

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.  
The initial calibration met all criteria including a standard run at or below the reporting level.  
All calibration verification standards (ICV, CCV) met criteria.  
All calibration blank verification standards (ICB, CCB) met criteria.  
The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.  
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.  
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

#### **QC (Batch Specific):**

**Batch 443444 (CB12148)**

CB11569

All LCS recoveries were within 70 - 130 with the following exceptions: None.  
All LCSD recoveries were within 70 - 130 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.  
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.





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## Certification Report

August 22, 2018

SDG I.D.: GCB11569

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### Mercury Narration

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### ICP Metals Narration

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Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

**Instrument:**

ARCOS 08/15/18 10:44 Emily Kolominskaya, Chemist 08/15/18  
CB11569

Additional criteria for CCV and ICSAB:

Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB). The linear range is defined daily by the calibration range.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

**QC (Site Specific):**

Batch 443265 (CB11569)

CB11569

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All MS recoveries were within 75 - 125 with the following exceptions: None.

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### PCB Narration

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Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:**

AU-ECD1 08/16/18-1 Adam Werner, Chemist 08/16/18  
CB11569

The initial calibration (PC815AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (PC815BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 15% except for the following compounds: None.

**QC (Batch Specific):**

Batch 443280 (CB11405)

CB11569

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

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### PEST Narration

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Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:**

AU-ECD35 08/16/18-1 Carol Wohlmuth, Chemist 08/16/18  
CB11569



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## RCP Certification Report

August 22, 2018

SDG I.D.: GCB11569

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### PEST Narration

The initial calibration (PS808AI) RSD for the compound list was less than 20% except for the following compounds: None.  
The initial calibration (PS808BI) RSD for the compound list was less than 20% except for the following compounds: None.  
The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.  
The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.  
The continuing calibration %D for the compound list was less than 20% except for the following compounds:None.

### QC (Batch Specific):

#### Batch 443254 (CB12510)

CB11569

All LCS recoveries were within 40 - 140 with the following exceptions: None.

The QC for this batch consists of a Blank, LCS, MS, and MSD.

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### SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443213 (Samples: CB11569): -----**

**The LCS and/or LCSD is below method criteria. A low bias for these analytes is possible. (Benzidine)**

**One or more analytes is below the method criteria. A low bias for these analytes is possible. (2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol)**

**The LCS/LCSD recoveries for one or more analytes is below the method criteria. A low bias for these analytes is possible(Benzoic Acid)**

### Instrument:

#### CHEM28 08/16/18-1

Keith Aloisa, Chemist 08/16/18

CB11569

Initial Calibration Verification (CHEM28/SPLIT0812TEST):

93% of target compounds met criteria.

The following compounds had %RSDs >20%: % Terphenyl-d14 21% (20%), 2,4-Dinitrophenol 40% (20%), 2-Methylphenol (o-cresol) 23% (20%), 2-Nitroaniline 33% (20%), 4,6-Dinitro-2-methylphenol 26% (20%), Benzoic acid 21% (20%)

The following compounds did not meet recommended response factors: 2-Nitrophenol 0.067 (0.1), Hexachlorobenzene 0.082 (0.1)

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM28/0816\_02-SPLIT0812TEST):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

97% of target compounds met criteria.

The following compounds did not meet % deviation criteria: 3,3'-Dichlorobenzidine 50%L (30%), Benzoic acid 33%L (30%)

The following compounds did not meet maximum % deviations: 3,3'-Dichlorobenzidine 50%L (40%)

The following compounds did not meet recommended response factors: 2-Nitrophenol 0.067 (0.1), Hexachlorobenzene 0.077 (0.1)

The following compounds did not meet minimum response factors: None.

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### QC (Batch Specific):



**Environmental Laboratories, Inc.**  
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## RCP Certification Report

August 22, 2018

SDG I.D.: GCB11569

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### **SVOA Narration**

#### **Batch 443213 (CB10817)**

CB11569

All LCS recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<10%), 4,6-Dinitro-2-methylphenol(16%), Benzoic Acid(<10%)

All LCSD recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<10%), 4,6-Dinitro-2-methylphenol(15%), Benzidine(29%), Benzoic Acid(<10%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

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### **VOA Narration**

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### **Instrument:**

#### **CHEM31 08/15/18-2**

Jane Li, Chemist 08/15/18

CB11570

Initial Calibration Verification (CHEM31/VT-L0808):

100% of target compounds met criteria.

The following compounds had %RSDs >20%: None.

The following compounds did not meet recommended response factors: Bromoform 0.087 (0.1), Tetrachloroethene 0.134 (0.2)

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM31/0815\_07-VT-L0808):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

100% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: Bromoform 0.094 (0.1)

The following compounds did not meet minimum response factors: None.

#### **QC (Batch Specific):**

#### **Batch 443585 (CB11571)**

CB11570

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%.

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### **Temperature Narration**

The samples were received at 4.3C with cooling initiated.

(Note acceptance criteria for relevant matrices is above freezing up to 6°C)



**CHAIN OF CUSTODY RECORD**

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040  
 Email: info@phoenixlabs.com Fax (860) 645-0823  
 Client Services (860) 645-8726

Customer: WSP  
 Address: 6 EXECUTIVE DRIVE  
FARMINGTON, CT 06032

Project: CTDAS - CCSU  
 Report to: MIKE SUSCA  
 Invoice to: MIKE SUSCA

Temp 4 °C Pg 1 of 1  
 Data Delivery/Contact Options:  
 Fax:   
 Phone: (203) 929-8555  
 Email: MIKE@EL.LABS.COM

Project P.O.:  
 This section **MUST** be completed with Bottle Quantities.

Sampler's Signature: [Signature] Date: 8/14/18

Matrix Code: GW=Ground Water SW=Surface Water WW=Waste Water  
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil  
B=Bulk L=Liquid

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Analysis Request
11569	B-8 (5-31.5)	S	8/14/18	1130	MR20 VOC MR22 PCB MR24 METALS ET PH PEST HERB MR01 MR02 MR03 MR04 MR05 MR06 MR07 MR08 MR09 MR10 MR11 MR12 MR13 MR14 MR15 MR16 MR17 MR18 MR19 MR20 MR21 MR22 MR23 MR24 MR25 MR26 MR27 MR28 MR29 MR30 MR31 MR32 MR33 MR34 MR35 MR36 MR37 MR38 MR39 MR40 MR41 MR42 MR43 MR44 MR45 MR46 MR47 MR48 MR49 MR50 MR51 MR52 MR53 MR54 MR55 MR56 MR57 MR58 MR59 MR60 MR61 MR62 MR63 MR64 MR65 MR66 MR67 MR68 MR69 MR70 MR71 MR72 MR73 MR74 MR75 MR76 MR77 MR78 MR79 MR80 MR81 MR82 MR83 MR84 MR85 MR86 MR87 MR88 MR89 MR90 MR91 MR92 MR93 MR94 MR95 MR96 MR97 MR98 MR99 MR00
11570	B-8 (31.5)	S	8/14/18	1135	MR20 VOC MR22 PCB MR24 METALS ET PH PEST HERB MR01 MR02 MR03 MR04 MR05 MR06 MR07 MR08 MR09 MR10 MR11 MR12 MR13 MR14 MR15 MR16 MR17 MR18 MR19 MR20 MR21 MR22 MR23 MR24 MR25 MR26 MR27 MR28 MR29 MR30 MR31 MR32 MR33 MR34 MR35 MR36 MR37 MR38 MR39 MR40 MR41 MR42 MR43 MR44 MR45 MR46 MR47 MR48 MR49 MR50 MR51 MR52 MR53 MR54 MR55 MR56 MR57 MR58 MR59 MR60 MR61 MR62 MR63 MR64 MR65 MR66 MR67 MR68 MR69 MR70 MR71 MR72 MR73 MR74 MR75 MR76 MR77 MR78 MR79 MR80 MR81 MR82 MR83 MR84 MR85 MR86 MR87 MR88 MR89 MR90 MR91 MR92 MR93 MR94 MR95 MR96 MR97 MR98 MR99 MR00

Relinquished by: [Signature] Accepted by: WSP FIELD  
WSP FIELD  
 Comments, Special Requirements or Regulations:  
WORK FOR CTDAS - DAS RATES APPLY - NO SALES TAX  
WASTE CHARACTERIZATION  
M9040 CORROSIIVITY M9095A PAINT FILTER TEST  
REACTIVITY M910 FLASH POINT

Date:	Time:	RI	CI	MA	Data Format
8/14/18	1315	<input type="checkbox"/> Direct Exposure (Residential) <input type="checkbox"/> GW <input type="checkbox"/> Other	<input checked="" type="checkbox"/> RCP Cert <input type="checkbox"/> GW Protection <input type="checkbox"/> SW Protection <input checked="" type="checkbox"/> UGA Mobility <input type="checkbox"/> GB Mobility <input checked="" type="checkbox"/> Residential DEC <input type="checkbox"/> IIC DEC <input type="checkbox"/> Other	<input type="checkbox"/> MCP Certification <input type="checkbox"/> GW-1 <input type="checkbox"/> GW-2 <input type="checkbox"/> GW-3 <input type="checkbox"/> S-1 <input type="checkbox"/> S-2 <input type="checkbox"/> S-3 <input type="checkbox"/> MWRA eSMART <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> PDF <input type="checkbox"/> GIS/Key <input type="checkbox"/> EQUIS <input type="checkbox"/> Other
8/15/18	1130				
8/15/18	1229				

State where samples were collected: CT  
 \* SURCHARGE APPLIES



Wednesday, August 29, 2018

Attn: Mr. Mike Susca  
WSP USA  
4 Research Dr Suite 204  
Shelton, CT 06484

Project ID: CTDAS-CCSU  
Sample ID#s: CB10356 - CB10365

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

Enclosed are revised Analysis Report pages. Please replace and discard the original pages. If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
UT Lab Registration #CT00007  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## SDG Comments

August 29, 2018

SDG I.D.: GCB10356

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### Metals Analysis:

The client requested a site specific list of elements which is shorter than the 6010 RCP list.

The holding time for pH is immediate. The sample was analyzed in the laboratory on receipt and may be considered out of hold.



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date                      Time  
 08/13/18                      15:30  
 08/14/18                      10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10356

Project ID: CTDAS-CCSU  
 Client ID: B-4 (1-5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	1	08/15/18	TH	SW6010C
Arsenic	3.80	0.84	mg/Kg	1	08/15/18	TH	SW6010C
Barium	73.3	0.42	mg/Kg	1	08/15/18	TH	SW6010C
Cadmium	< 0.42	0.42	mg/Kg	1	08/15/18	TH	SW6010C
Chromium	20.4	0.42	mg/Kg	1	08/15/18	TH	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	08/15/18	RS	SW7471B
Lead	16.6	0.42	mg/Kg	1	08/15/18	EK	SW6010C
Selenium	< 1.7	1.7	mg/Kg	1	08/15/18	EK	SW6010C
Percent Solid	83		%		08/14/18	Q	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/14/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/16/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/16/18	Y	SW846-Ignit
pH at 25C - Soil	8.10	1.00	pH Units	1	08/14/18 19:04	O	SW9045
Reactivity Cyanide	< 6	6	mg/Kg	1	08/15/18	BS/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/15/18	BS/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/15/18	BS/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/14/18	BB/V	SW3545A
Soil Extraction for SVOA	Completed				08/14/18	BJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	NT/VCK	SW3545A
Mercury Digestion	Completed				08/15/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/14/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/14/18	C/D	SW8151A
Extraction for PCB	Completed				08/14/18	KD/AK/KL	SW3540C
Total Metals Digest	Completed				08/14/18	KD/AG	SW3050B

Chlorinated Herbicides

2,4,5-T	ND	100	ug/Kg	10	08/15/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	100	ug/Kg	10	08/15/18	CW	SW8151A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2,4-D	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
2,4-DB	ND	2000	ug/Kg	10	08/15/18	CW	SW8151A
Dalapon	ND	100	ug/Kg	10	08/15/18	CW	SW8151A
Dicamba	ND	100	ug/Kg	10	08/15/18	CW	SW8151A
Dichloroprop	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
Dinoseb	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	128		%	10	08/15/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	120	60	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	**		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	57		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1221	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1232	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1242	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1248	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1254	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1260	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1262	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1268	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	85		%	10	08/15/18	AW	30 - 150 %
% TCMX	95		%	10	08/15/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDE	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDT	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
a-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Alachlor	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Aldrin	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
b-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Chlordane	ND	40	ug/Kg	2	08/15/18	CW	SW8081B
d-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Dieldrin	ND	4.0	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan I	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan II	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan sulfate	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin aldehyde	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin ketone	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
g-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor epoxide	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Methoxychlor	ND	40	ug/Kg	2	08/15/18	CW	SW8081B



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Toxaphene	ND	160	ug/Kg	2	08/15/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	67		%	2	08/15/18	CW	30 - 150 %
% TCMX	65		%	2	08/15/18	CW	30 - 150 %
<b><u>Semivolatiles</u></b>							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/15/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
1,3-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,4-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dichlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dimethylphenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2-Chloronaphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Chlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylnaphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitrophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	400	ug/Kg	1	08/15/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	400	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitrophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthylene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acetophenone	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benz(a)anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(a)pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(b)fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(ghi)perylene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(k)fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzoic acid	ND	800	ug/Kg	1	08/15/18	HM	SW8270D
Benzyl butyl phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	400	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Bis(2-chloroisopropyl)ether	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Chrysene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Diethyl phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dimethylphthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-butylphthalate	ND	400	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-octylphthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Fluorene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachloroethane	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Isophorone	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Naphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/15/18	HM	SW8270D
Pentachlorophenol	ND	400	ug/Kg	1	08/15/18	HM	SW8270D
Phenanthrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Phenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	86		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorobiphenyl	66		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorophenol	51		%	1	08/15/18	HM	30 - 130 %
% Nitrobenzene-d5	57		%	1	08/15/18	HM	30 - 130 %
% Phenol-d5	62		%	1	08/15/18	HM	30 - 130 %
% Terphenyl-d14	71		%	1	08/15/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
 QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

### Comments:

Corrosivity is based solely on the pH analysis performed above.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

#### Semi-Volatile Comment:

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

#### TPH Comment:

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.  
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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
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# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

## Date

08/13/18  
 08/14/18

## Time

15:25  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10357

Project ID: CTDAS-CCSU  
 Client ID: B-4 (4)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	85		%		08/14/18	Q	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	3.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	25	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	25	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	250	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	3.0	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	30	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	10	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	10	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	10	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	10	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	96		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	103		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	88		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/13/18		SW5035A

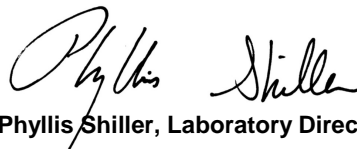
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



**Environmental Laboratories, Inc.**  
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# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date

08/13/18  
 08/14/18

Time

9:00  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10358

Project ID: CTDAS-CCSU  
 Client ID: B-5 (1-5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.41	0.41	mg/Kg	1	08/15/18	TH	SW6010C
Arsenic	4.44	0.82	mg/Kg	1	08/15/18	TH	SW6010C
Barium	152	0.41	mg/Kg	1	08/15/18	TH	SW6010C
Cadmium	0.76	0.41	mg/Kg	1	08/15/18	TH	SW6010C
Chromium	20.0	0.41	mg/Kg	1	08/15/18	TH	SW6010C
Mercury	0.04	0.03	mg/Kg	1	08/15/18	RS	SW7471B
Lead	34.4	0.41	mg/Kg	1	08/15/18	EK	SW6010C
Selenium	< 1.6	1.6	mg/Kg	1	08/15/18	EK	SW6010C
Percent Solid	85		%		08/14/18	Q	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/14/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/16/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/16/18	Y	SW846-Ignit
pH at 25C - Soil	8.24	1.00	pH Units	1	08/14/18 19:04	O	SW9045
Reactivity Cyanide	< 6	6	mg/Kg	1	08/16/18	BS/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/16/18	BS/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/16/18	BS/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/14/18	BB/V	SW3545A
Soil Extraction for SVOA	Completed				08/14/18	BJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	NT/VCK	SW3545A
Mercury Digestion	Completed				08/15/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/14/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/14/18	C/D	SW8151A
Extraction for PCB	Completed				08/14/18	KD/AK/KL	SW3540C
Total Metals Digest	Completed				08/14/18	KD/AG	SW3050B

Chlorinated Herbicides

2,4,5-T	ND	98	ug/Kg	10	08/15/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	98	ug/Kg	10	08/15/18	CW	SW8151A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2,4-D	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
2,4-DB	ND	2000	ug/Kg	10	08/15/18	CW	SW8151A
Dalapon	ND	98	ug/Kg	10	08/15/18	CW	SW8151A
Dicamba	ND	98	ug/Kg	10	08/15/18	CW	SW8151A
Dichloroprop	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
Dinoseb	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	112		%	10	08/15/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	97	58	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	**		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	55		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1221	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1232	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1242	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1248	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1254	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1260	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1262	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1268	ND	390	ug/Kg	10	08/15/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	92		%	10	08/15/18	AW	30 - 150 %
% TCMX	103		%	10	08/15/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDE	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDT	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
a-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Alachlor	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Aldrin	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
b-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Chlordane	ND	39	ug/Kg	2	08/15/18	CW	SW8081B
d-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Dieldrin	ND	3.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan I	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan II	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan sulfate	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Endrin	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Endrin aldehyde	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Endrin ketone	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
g-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor epoxide	ND	7.8	ug/Kg	2	08/15/18	CW	SW8081B
Methoxychlor	ND	39	ug/Kg	2	08/15/18	CW	SW8081B



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Toxaphene	ND	160	ug/Kg	2	08/15/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	77		%	2	08/15/18	CW	30 - 150 %
% TCMX	76		%	2	08/15/18	CW	30 - 150 %
<b><u>Semivolatiles</u></b>							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/15/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Dichlorobenzene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
1,3-Dichlorobenzene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
1,4-Dichlorobenzene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dichlorophenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dimethylphenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2-Chloronaphthalene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2-Chlorophenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylnaphthalene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitrophenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitrophenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthylene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Acetophenone	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Anthracene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benz(a)anthracene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(a)pyrene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(b)fluoranthene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(ghi)perylene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(k)fluoranthene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Benzoic acid	ND	780	ug/Kg	1	08/15/18	HM	SW8270D
Benzyl butyl phthalate	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	390	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Bis(2-chloroisopropyl)ether	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Chrysene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Diethyl phthalate	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Dimethylphthalate	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-butylphthalate	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-octylphthalate	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Fluoranthene	290	270	ug/Kg	1	08/15/18	HM	SW8270D
Fluorene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobenzene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Hexachloroethane	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Isophorone	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Naphthalene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/15/18	HM	SW8270D
Pentachlorophenol	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
Phenanthrene	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Phenol	ND	270	ug/Kg	1	08/15/18	HM	SW8270D
Pyrene	280	270	ug/Kg	1	08/15/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	88		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorobiphenyl	69		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorophenol	59		%	1	08/15/18	HM	30 - 130 %
% Nitrobenzene-d5	67		%	1	08/15/18	HM	30 - 130 %
% Phenol-d5	69		%	1	08/15/18	HM	30 - 130 %
% Terphenyl-d14	77		%	1	08/15/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

### **Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

#### Semi-Volatile Comment:

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

#### TPH Comment:

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C14 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

## Date

08/13/18  
 08/14/18

## Time

8:55  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10359

Project ID: CTDAS-CCSU  
 Client ID: B-5 (4.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	88		%		08/14/18	Q	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	2.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	24	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	24	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	240	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	2.9	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	29	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	9.8	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	9.8	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	9.8	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	9.8	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	4.9	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	96		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	97		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	98		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	89		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/13/18		SW5035A

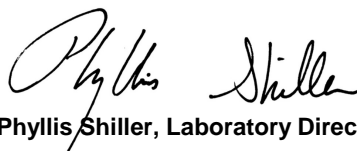
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



**Environmental Laboratories, Inc.**  
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# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date

08/13/18  
 08/14/18

Time

12:00  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10360

Project ID: CTDAS-CCSU  
 Client ID: B-5 (5-35.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Arsenic	3.07	0.75	mg/Kg	1	08/15/18	TH	SW6010C
Barium	91.0	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Cadmium	< 0.38	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Chromium	18.6	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	08/15/18	RS	SW7471B
Lead	9.04	0.38	mg/Kg	1	08/15/18	EK	SW6010C
Selenium	< 1.5	1.5	mg/Kg	1	08/15/18	EK	SW6010C
Percent Solid	84		%		08/14/18	Q	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/14/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/16/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/16/18	Y	SW846-Ignit
pH at 25C - Soil	7.42	1.00	pH Units	1	08/14/18 19:04	O	SW9045
Reactivity Cyanide	< 6	6	mg/Kg	1	08/16/18	BS/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/16/18	BS/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/16/18	BS/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/14/18	BB/V	SW3545A
Soil Extraction for SVOA	Completed				08/14/18	BJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	NT/VCK	SW3545A
Mercury Digestion	Completed				08/15/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/14/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/14/18	C/D	SW8151A
Extraction for PCB	Completed				08/14/18	KD/AK/KL	SW3540C
Total Metals Digest	Completed				08/14/18	KD/AG	SW3050B

Chlorinated Herbicides

2,4,5-T	ND	99	ug/Kg	10	08/15/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	99	ug/Kg	10	08/15/18	CW	SW8151A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2,4-D	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
2,4-DB	ND	2000	ug/Kg	10	08/15/18	CW	SW8151A
Dalapon	ND	99	ug/Kg	10	08/15/18	CW	SW8151A
Dicamba	ND	99	ug/Kg	10	08/15/18	CW	SW8151A
Dichloroprop	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
Dinoseb	ND	200	ug/Kg	10	08/15/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	122		%	10	08/15/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	ND	59	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	57		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1221	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1232	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1242	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1248	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1254	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1260	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1262	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
PCB-1268	ND	390	ug/Kg	10	08/16/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	76		%	10	08/16/18	AW	30 - 150 %
% TCMX	87		%	10	08/16/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDE	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDT	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
a-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Alachlor	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Aldrin	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
b-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Chlordane	ND	39	ug/Kg	2	08/15/18	CW	SW8081B
d-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Dieldrin	ND	3.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan I	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan II	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan sulfate	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin aldehyde	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Endrin ketone	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
g-BHC	ND	1.6	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor epoxide	ND	7.9	ug/Kg	2	08/15/18	CW	SW8081B
Methoxychlor	ND	39	ug/Kg	2	08/15/18	CW	SW8081B



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Toxaphene	ND	160	ug/Kg	2	08/15/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	72		%	2	08/15/18	CW	30 - 150 %
% TCMX	70		%	2	08/15/18	CW	30 - 150 %
<b><u>Semivolatiles</u></b>							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/15/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
1,3-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
1,4-Dichlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dichlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dimethylphenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2-Chloronaphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Chlorophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylnaphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitrophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitrophenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthylene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Acetophenone	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benz(a)anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(a)pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(b)fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(ghi)perylene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(k)fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Benzoic acid	ND	790	ug/Kg	1	08/15/18	HM	SW8270D
Benzyl butyl phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	390	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Bis(2-chloroisopropyl)ether	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Chrysene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Diethyl phthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Dimethylphthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-butylphthalate	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-octylphthalate	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Fluoranthene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Fluorene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobenzene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Hexachloroethane	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Isophorone	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Naphthalene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/15/18	HM	SW8270D
Pentachlorophenol	ND	390	ug/Kg	1	08/15/18	HM	SW8270D
Phenanthrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Phenol	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Pyrene	ND	280	ug/Kg	1	08/15/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	85		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorobiphenyl	67		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorophenol	57		%	1	08/15/18	HM	30 - 130 %
% Nitrobenzene-d5	64		%	1	08/15/18	HM	30 - 130 %
% Phenol-d5	65		%	1	08/15/18	HM	30 - 130 %
% Terphenyl-d14	69		%	1	08/15/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

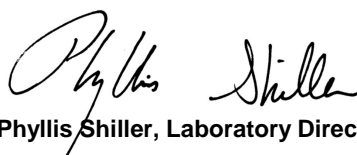
**Semi-Volatile Comment:**

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
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 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

## Date

08/13/18  
 08/14/18

## Time

11:55  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10361

Project ID: CTDAS-CCSU  
 Client ID: B-5 (35)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	85		%		08/14/18	Q	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	4.3	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	7.0	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	36	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C

Client ID: B-5 (35)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	36	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	360	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	4.3	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	43	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	14	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	14	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	14	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	14	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	7.2	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	97		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	104		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	89		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/13/18		SW5035A

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

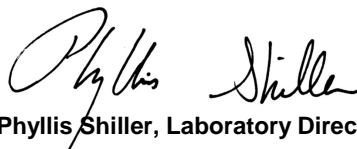
**Comments:**

**Volatile Comment:**

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.  
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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



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# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date

08/13/18  
 08/14/18

Time

9:00  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10362

Project ID: CTDAS-CCSU  
 Client ID: B-7 (1-5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Arsenic	4.43	0.77	mg/Kg	1	08/15/18	TH	SW6010C
Barium	85.5	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Cadmium	0.41	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Chromium	21.3	0.38	mg/Kg	1	08/15/18	TH	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	08/15/18	RS	SW7471B
Lead	12.2	0.38	mg/Kg	1	08/15/18	EK	SW6010C
Selenium	< 1.5	1.5	mg/Kg	1	08/15/18	EK	SW6010C
Percent Solid	87		%		08/14/18	Q	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/14/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/16/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/16/18	Y	SW846-Ignit
pH at 25C - Soil	8.54	1.00	pH Units	1	08/14/18 19:04	O	SW9045
Reactivity Cyanide	< 6	6	mg/Kg	1	08/21/18	EG/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/21/18	EG/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/21/18	EG/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/14/18	BB/V	SW3545A
Soil Extraction for SVOA	Completed				08/14/18	BJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	NT/VCK	SW3545A
Mercury Digestion	Completed				08/15/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/14/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/14/18	C/D	SW8151A
Extraction for PCB	Completed				08/14/18	KD/AK/KL	SW3540C
SPLP Extraction for Organics	Completed				08/23/18	I	SW1312
SPLP Pesticides Ext. (2 L to 1ml)	Completed				08/24/18		SW3510C
Total Metals Digest	Completed				08/14/18	KD/AG	SW3050B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b><u>Chlorinated Herbicides</u></b>							
2,4,5-T	ND	95	ug/Kg	10	08/15/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	95	ug/Kg	10	08/15/18	CW	SW8151A
2,4-D	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
2,4-DB	ND	1900	ug/Kg	10	08/15/18	CW	SW8151A
Dalapon	ND	95	ug/Kg	10	08/15/18	CW	SW8151A
Dicamba	ND	95	ug/Kg	10	08/15/18	CW	SW8151A
Dichloroprop	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
Dinoseb	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	125		%	10	08/15/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	69	56	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	**		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	57		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1221	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1232	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1242	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1248	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1254	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1260	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1262	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1268	ND	380	ug/Kg	10	08/15/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	101		%	10	08/15/18	AW	30 - 150 %
% TCMX	104		%	10	08/15/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDE	28	7.6	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDT	18	7.6	ug/Kg	2	08/15/18	CW	SW8081B
a-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Alachlor	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Aldrin	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
b-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Chlordane	ND	38	ug/Kg	2	08/15/18	CW	SW8081B
d-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Dieldrin	ND	3.8	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan I	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan II	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan sulfate	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Endrin	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Endrin aldehyde	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Endrin ketone	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
g-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor epoxide	ND	7.6	ug/Kg	2	08/15/18	CW	SW8081B
Methoxychlor	ND	38	ug/Kg	2	08/15/18	CW	SW8081B
Toxaphene	ND	150	ug/Kg	2	08/15/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	69		%	2	08/15/18	CW	30 - 150 %
% TCMX	65		%	2	08/15/18	CW	30 - 150 %

**SPLP Pesticides (GA Criteria)**

4,4' -DDD	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
4,4' -DDE	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
4,4' -DDT	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
a-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Alachlor	ND	0.010	ug/L	1	08/27/18	CW	SW8081B
Aldrin	ND	0.003	ug/L	1	08/27/18	CW	SW8081B
b-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Chlordane	ND	0.050	ug/L	1	08/27/18	CW	SW8081B
d-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Dieldrin	ND	0.002	ug/L	1	08/27/18	CW	SW8081B
Endosulfan I	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endosulfan II	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endosulfan sulfate	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin aldehyde	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin Ketone	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
g-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Heptachlor	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Heptachlor epoxide	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Methoxychlor	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Toxaphene	ND	0.20	ug/L	1	08/27/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
%DCBP (Surrogae Rec)	67		%	1	08/27/18	CW	30 - 150 %
%TCMX (Surrogate Rec)	96		%	1	08/27/18	CW	30 - 150 %

**Semivolatiles**

1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/15/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Dichlorobenzene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
1,3-Dichlorobenzene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
1,4-Dichlorobenzene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dichlorophenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dimethylphenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2-Chloronaphthalene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2-Chlorophenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylnaphthalene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitrophenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	380	ug/Kg	1	08/15/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	380	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitrophenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthylene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Acetophenone	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Anthracene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benz(a)anthracene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(a)pyrene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(b)fluoranthene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(ghi)perylene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(k)fluoranthene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Benzoic acid	ND	750	ug/Kg	1	08/15/18	HM	SW8270D
Benzyl butyl phthalate	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	380	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroisopropyl)ether	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Chrysene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Diethyl phthalate	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Dimethylphthalate	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-butylphthalate	ND	380	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-octylphthalate	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Fluoranthene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Fluorene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobenzene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Hexachloroethane	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Isophorone	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Naphthalene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Nitrobenzene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/15/18	HM	SW8270D
Pentachlorophenol	ND	380	ug/Kg	1	08/15/18	HM	SW8270D
Phenanthrene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Phenol	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Pyrene	ND	260	ug/Kg	1	08/15/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	88		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorobiphenyl	71		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorophenol	56		%	1	08/15/18	HM	30 - 130 %
% Nitrobenzene-d5	64		%	1	08/15/18	HM	30 - 130 %
% Phenol-d5	64		%	1	08/15/18	HM	30 - 130 %
% Terphenyl-d14	72		%	1	08/15/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
 QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

### **Comments:**

Corrosivity is based solely on the pH analysis performed above.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

#### Semi-Volatile Comment:

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

#### TPH Comment:

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.  
 This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

## Date

08/13/18  
 08/14/18

## Time

9:00  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10363

Project ID: CTDAS-CCSU  
 Client ID: B-7 (2.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	90		%		08/14/18	Q	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	2.3	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	19	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	19	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	190	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	2.3	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	23	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	7.7	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	7.7	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	7.7	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	7.7	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	3.8	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	95		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	90		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	101		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	88		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/13/18		SW5035A

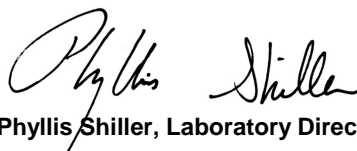
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date

08/13/18  
 08/14/18

Time

15:00  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10364

Project ID: CTDAS-CCSU  
 Client ID: B-8 (1-5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.33	0.33	mg/Kg	1	08/15/18	TH	SW6010C
Arsenic	4.65	0.66	mg/Kg	1	08/15/18	TH	SW6010C
Barium	93.8	0.33	mg/Kg	1	08/15/18	TH	SW6010C
Cadmium	0.60	0.33	mg/Kg	1	08/15/18	TH	SW6010C
Chromium	24.4	0.33	mg/Kg	1	08/15/18	TH	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	08/15/18	RS	SW7471B
Lead	22.1	0.33	mg/Kg	1	08/15/18	EK	SW6010C
Selenium	< 1.3	1.3	mg/Kg	1	08/15/18	EK	SW6010C
Percent Solid	89		%		08/14/18	Q	SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	08/14/18	O	SW846-Corr
Flash Point	>200	200	Degree F	1	08/16/18	Y	SW1010A
Ignitability	Passed	140	degree F	1	08/16/18	Y	SW846-Ignit
pH at 25C - Soil	9.36	1.00	pH Units	1	08/14/18 19:04	O	SW9045
Reactivity Cyanide	< 5	5	mg/Kg	1	08/21/18	EG/GD	SW846-ReactCyn
Reactivity Sulfide	< 20	20	mg/Kg	1	08/21/18	EG/GD	SW-7.3
Reactivity	Negative		Pos/Neg	1	08/21/18	EG/GD	SW846-React
Soil Extraction for Pesticide	Completed				08/14/18	BB/V	SW3545A
Soil Extraction for SVOA	Completed				08/14/18	BJ/CKV	SW3545A
Extraction of CT ETPH	Completed				08/15/18	NT/VCK	SW3545A
Mercury Digestion	Completed				08/15/18	I/I	SW7471B
Paint Filter Test	Passed		PASS/FAIL		08/14/18	J	SW9095B
Soil Extraction for Herbicide	Completed				08/14/18	C/D	SW8151A
Extraction for PCB	Completed				08/14/18	KD/AK/KL	SW3540C
SPLP Extraction for Organics	Completed				08/23/18	I	SW1312
SPLP Pesticides Ext. (2 L to 1ml)	Completed				08/24/18		SW3510C
Total Metals Digest	Completed				08/14/18	KD/AG	SW3050B



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b><u>Chlorinated Herbicides</u></b>							
2,4,5-T	ND	93	ug/Kg	10	08/15/18	CW	SW8151A
2,4,5-TP (Silvex)	ND	93	ug/Kg	10	08/15/18	CW	SW8151A
2,4-D	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
2,4-DB	ND	1900	ug/Kg	10	08/15/18	CW	SW8151A
Dalapon	ND	93	ug/Kg	10	08/15/18	CW	SW8151A
Dicamba	ND	93	ug/Kg	10	08/15/18	CW	SW8151A
Dichloroprop	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
Dinoseb	ND	190	ug/Kg	10	08/15/18	CW	SW8151A
<b><u>QA/QC Surrogates</u></b>							
% DCAA	117		%	10	08/15/18	CW	30 - 150 %
<b><u>TPH by GC (Extractable Products)</u></b>							
Ext. Petroleum H.C. (C9-C36)	280	54	mg/Kg	1	08/16/18	JRB	CTETPH 8015D
Identification	**		mg/Kg	1	08/16/18	JRB	CTETPH 8015D
<b><u>QA/QC Surrogates</u></b>							
% n-Pentacosane	53		%	1	08/16/18	JRB	50 - 150 %
<b><u>PCB (Soxhlet SW3540C)</u></b>							
PCB-1016	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1221	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1232	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1242	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1248	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1254	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1260	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1262	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
PCB-1268	ND	370	ug/Kg	10	08/15/18	AW	SW8082A
<b><u>QA/QC Surrogates</u></b>							
% DCBP	94		%	10	08/15/18	AW	30 - 150 %
% TCMX	106		%	10	08/15/18	AW	30 - 150 %
<b><u>Pesticides</u></b>							
4,4' -DDD	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDE	4.1	1.5	ug/Kg	2	08/15/18	CW	SW8081B
4,4' -DDT	5.1	1.5	ug/Kg	2	08/15/18	CW	SW8081B
a-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Alachlor	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Aldrin	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
b-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Chlordane	ND	37	ug/Kg	2	08/15/18	CW	SW8081B
d-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Dieldrin	ND	3.7	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan I	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan II	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Endosulfan sulfate	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Endrin	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Endrin aldehyde	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Endrin ketone	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
g-BHC	ND	1.5	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Heptachlor epoxide	ND	7.3	ug/Kg	2	08/15/18	CW	SW8081B
Methoxychlor	ND	37	ug/Kg	2	08/15/18	CW	SW8081B
Toxaphene	ND	150	ug/Kg	2	08/15/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
% DCBP	74		%	2	08/15/18	CW	30 - 150 %
% TCMX	67		%	2	08/15/18	CW	30 - 150 %

**SPLP Pesticides (GA Criteria)**

4,4' -DDD	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
4,4' -DDE	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
4,4' -DDT	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
a-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Alachlor	ND	0.010	ug/L	1	08/27/18	CW	SW8081B
Aldrin	ND	0.003	ug/L	1	08/27/18	CW	SW8081B
b-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Chlordane	ND	0.050	ug/L	1	08/27/18	CW	SW8081B
d-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Dieldrin	ND	0.002	ug/L	1	08/27/18	CW	SW8081B
Endosulfan I	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endosulfan II	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endosulfan sulfate	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin aldehyde	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Endrin Ketone	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
g-BHC	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Heptachlor	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Heptachlor epoxide	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Methoxychlor	ND	0.005	ug/L	1	08/27/18	CW	SW8081B
Toxaphene	ND	0.20	ug/L	1	08/27/18	CW	SW8081B
<b><u>QA/QC Surrogates</u></b>							
%DCBP (Surrogae Rec)	77		%	1	08/27/18	CW	30 - 150 %
%TCMX (Surrogate Rec)	80		%	1	08/27/18	CW	30 - 150 %

**Semivolatiles**

1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	08/15/18	HM	SW8270D
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Dichlorobenzene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
1,3-Dichlorobenzene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
1,4-Dichlorobenzene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dichlorophenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dimethylphenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
2-Chloronaphthalene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2-Chlorophenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylnaphthalene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
2-Nitrophenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	08/15/18	HM	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	08/15/18	HM	SW8270D
4-Nitrophenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Acenaphthylene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Acetophenone	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Aniline	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Anthracene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benz(a)anthracene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benzidine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(a)pyrene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(b)fluoranthene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(ghi)perylene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benzo(k)fluoranthene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Benzoic acid	ND	730	ug/Kg	1	08/15/18	HM	SW8270D
Benzyl butyl phthalate	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-chloroisopropyl)ether	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Bis(2-ethylhexyl)phthalate	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Carbazole	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Chrysene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Diethyl phthalate	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Dimethylphthalate	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-butylphthalate	ND	360	ug/Kg	1	08/15/18	HM	SW8270D
Di-n-octylphthalate	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Fluoranthene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Fluorene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobenzene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Hexachloroethane	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Isophorone	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Naphthalene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Nitrobenzene	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	08/15/18	HM	SW8270D
Pentachlorophenol	ND	360	ug/Kg	1	08/15/18	HM	SW8270D
Phenanthrene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Phenol	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Pyrene	ND	250	ug/Kg	1	08/15/18	HM	SW8270D
Pyridine	ND	200	ug/Kg	1	08/15/18	HM	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2,4,6-Tribromophenol	89		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorobiphenyl	71		%	1	08/15/18	HM	30 - 130 %
% 2-Fluorophenol	58		%	1	08/15/18	HM	30 - 130 %
% Nitrobenzene-d5	66		%	1	08/15/18	HM	30 - 130 %
% Phenol-d5	69		%	1	08/15/18	HM	30 - 130 %
% Terphenyl-d14	74		%	1	08/15/18	HM	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
 QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

### Comments:

Corrosivity is based solely on the pH analysis performed above.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

#### Semi-Volatile Comment:

Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

#### TPH Comment:

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C26 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

August 29, 2018

FOR: Attn: Mr. Mike Susca  
 WSP USA  
 4 Research Dr Suite 204  
 Shelton, CT 06484

## Sample Information

Matrix: SOIL  
 Location Code: WSP-DAS  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

## Date

08/13/18  
 08/14/18

## Time

14:55  
 10:15

## Laboratory Data

SDG ID: GCB10356  
 Phoenix ID: CB10365

Project ID: CTDAS-CCSU  
 Client ID: B-8 (3.5)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	85		%		08/14/18	Q	SW846-%Solid

## Volatiles

1,1,1,2-Tetrachloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,1-Trichloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	2.9	ug/Kg	1	08/15/18	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloroethene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,1-Dichloropropene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,3-Trichloropropane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dibromoethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,2-Dichloropropane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,3-Dichloropropane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
2,2-Dichloropropane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
2-Chlorotoluene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
2-Hexanone	ND	24	ug/Kg	1	08/15/18	JLI	SW8260C
2-Isopropyltoluene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
4-Chlorotoluene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Methyl-2-pentanone	ND	24	ug/Kg	1	08/15/18	JLI	SW8260C
Acetone	ND	240	ug/Kg	1	08/15/18	JLI	SW8260C
Acrylonitrile	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Benzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromochloromethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromodichloromethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromoform	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Bromomethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon Disulfide	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Carbon tetrachloride	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chlorobenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloroform	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Chloromethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,2-Dichloroethene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
cis-1,3-Dichloropropene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromochloromethane	ND	2.9	ug/Kg	1	08/15/18	JLI	SW8260C
Dibromomethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Dichlorodifluoromethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Ethylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Hexachlorobutadiene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Isopropylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
m&p-Xylene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl Ethyl Ketone	ND	29	ug/Kg	1	08/15/18	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	9.6	ug/Kg	1	08/15/18	JLI	SW8260C
Methylene chloride	ND	9.6	ug/Kg	1	08/15/18	JLI	SW8260C
Naphthalene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
n-Butylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
n-Propylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
o-Xylene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
p-Isopropyltoluene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
sec-Butylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Styrene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
tert-Butylbenzene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrachloroethene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Tetrahydrofuran (THF)	ND	9.6	ug/Kg	1	08/15/18	JLI	SW8260C
Toluene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Total Xylenes	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,2-Dichloroethene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,3-Dichloropropene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	9.6	ug/Kg	1	08/15/18	JLI	SW8260C
Trichloroethene	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorofluoromethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Trichlorotrifluoroethane	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
Vinyl chloride	ND	4.8	ug/Kg	1	08/15/18	JLI	SW8260C
<b>QA/QC Surrogates</b>							
% 1,2-dichlorobenzene-d4	100		%	1	08/15/18	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	08/15/18	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Dibromofluoromethane	99		%	1	08/15/18	JLI	70 - 130 %
% Toluene-d8	88		%	1	08/15/18	JLI	70 - 130 %
Field Extraction	Completed				08/13/18		SW5035A

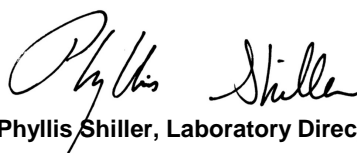
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services.

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**Phyllis Shiller, Laboratory Director**

**August 29, 2018**

**Reviewed and Released by: Maryam Taylor, Project Manager**





Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

August 29, 2018

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443110 (mg/kg), QC Sample No: CB10180 (CB10356, CB10358, CB10360, CB10362, CB10364)													
<b>ICP Metals - Soil</b>													
Arsenic	BRL	0.70	10.4	10.9	4.70	91.4			89.8			75 - 125	30
Barium	BRL	0.35	34.9	35.1	0.60	95.7			95.6			75 - 125	30
Cadmium	BRL	0.35	<0.36	<0.38	NC	88.4			92.0			75 - 125	30
Chromium	BRL	0.35	16.5	16.4	0.60	97.8			96.6			75 - 125	30
Lead	BRL	0.35	2.24	1.82	NC	92.8			95.4			75 - 125	30
Selenium	BRL	1.4	<1.4	<1.5	NC	77.1			76.8			75 - 125	30
Silver	BRL	0.35	<0.36	<0.38	NC	94.9			95.6			75 - 125	30

QA/QC Batch 443190 (mg/kg), QC Sample No: CB10180 (CB10356, CB10358, CB10360, CB10362, CB10364)

Mercury - Soil	BRL	0.03	<0.03	<0.03	NC	96.4	96.8	0.4	98.7			70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.



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# QA/QC Report

August 29, 2018

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443540 (Degree F), QC Sample No: CB09959 (CB10356, CB10358, CB10360, CB10362, CB10364)													
Flash Point			>200	>200	NC	100						75 - 125	30
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 443169 (PH), QC Sample No: CB10356 (CB10356, CB10358, CB10360, CB10362, CB10364)													
pH at 25C - Soil			8.10	8.09	0.10	100						85 - 115	20
QA/QC Batch 443440 (mg/Kg), QC Sample No: CB10360 4.81X (CB10358, CB10360)													
Reactivity Cyanide	BRL	0.05	<6	<5.6	NC	98.7						85 - 115	30
QA/QC Batch 443188 (mg/Kg), QC Sample No: CB10829 4.72X (CB10356)													
Reactivity Cyanide	BRL	0.05	<6	<5.5	NC	98.3						85 - 115	30
QA/QC Batch 444056 (mg/Kg), QC Sample No: CB15111 5X (CB10362, CB10364)													
Reactivity Cyanide	BRL	0.05	<6	<5.6	NC	99.8						85 - 115	30



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# QA/QC Report

August 29, 2018

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 443109 (ug/Kg), QC Sample No: CB10041 10X (CB10356, CB10358, CB10360, CB10362, CB10364)										
<u>Chlorinated Herbicides - Soil</u>										
2,4,5-T	ND	83	77	76	1.3	78	75	3.9	40 - 140	30
2,4,5-TP (Silvex)	ND	83	85	82	3.6	85	79	7.3	40 - 140	30
2,4-D	ND	170	78	76	2.6	78	72	8.0	40 - 140	30
2,4-DB	ND	1700	79	74	6.5	81	72	11.8	40 - 140	30
Dalapon	ND	83	46	65	34.2	38	120	103.8	40 - 140	30
Dicamba	ND	83	89	85	4.6	88	86	2.3	40 - 140	30
Dichloroprop	ND	170	97	92	5.3	95	88	7.7	40 - 140	30
Dinoseb	ND	170	74	72	2.7	77	72	6.7	40 - 140	30
% DCAA (Surrogate Rec)	124	%	132	125	5.4	130	119	8.8	30 - 150	30
QA/QC Batch 443103 (ug/Kg), QC Sample No: CB10184 10X (CB10356, CB10358, CB10360, CB10362, CB10364)										
<u>Polychlorinated Biphenyls - Soil</u>										
PCB-1016	ND	170	88	91	3.4	63	74	16.1	40 - 140	30
PCB-1221	ND	170							40 - 140	30
PCB-1232	ND	170							40 - 140	30
PCB-1242	ND	170							40 - 140	30
PCB-1248	ND	170							40 - 140	30
PCB-1254	ND	170							40 - 140	30
PCB-1260	ND	170	93	108	14.9	83	97	15.6	40 - 140	30
PCB-1262	ND	170							40 - 140	30
PCB-1268	ND	170							40 - 140	30
% DCBP (Surrogate Rec)	95	%	96	106	9.9	80	91	12.9	30 - 150	30
% TCMX (Surrogate Rec)	96	%	97	106	8.9	76	91	18.0	30 - 150	30
QA/QC Batch 443237 (ug/kg), QC Sample No: CB10355 (CB10357, CB10359, CB10361, CB10363, CB10365)										
<u>Volatiles - Soil</u>										
1,1,1,2-Tetrachloroethane	ND	5.0	91	93	2.2	90	89	1.1	70 - 130	30
1,1,1-Trichloroethane	ND	5.0	107	103	3.8	110	105	4.7	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	3.0	102	104	1.9	124	120	3.3	70 - 130	30
1,1,2-Trichloroethane	ND	5.0	99	101	2.0	94	92	2.2	70 - 130	30
1,1-Dichloroethane	ND	5.0	110	115	4.4	132	125	5.4	70 - 130	30
1,1-Dichloroethene	ND	5.0	114	114	0.0	114	110	3.6	70 - 130	30
1,1-Dichloropropene	ND	5.0	106	107	0.9	97	97	0.0	70 - 130	30
1,2,3-Trichlorobenzene	ND	5.0	107	107	0.0	102	104	1.9	70 - 130	30
1,2,3-Trichloropropane	ND	5.0	94	95	1.1	123	123	0.0	70 - 130	30
1,2,4-Trichlorobenzene	ND	5.0	102	102	0.0	99	98	1.0	70 - 130	30
1,2,4-Trimethylbenzene	ND	1.0	99	98	1.0	79	80	1.3	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	5.0	94	101	7.2	99	99	0.0	70 - 130	30
1,2-Dibromoethane	ND	5.0	100	100	0.0	99	99	0.0	70 - 130	30
1,2-Dichlorobenzene	ND	5.0	107	106	0.9	94	96	2.1	70 - 130	30
1,2-Dichloroethane	ND	5.0	107	107	0.0	103	103	0.0	70 - 130	30
1,2-Dichloropropane	ND	5.0	105	106	0.9	103	103	0.0	70 - 130	30

QA/QC Data

SDG I.D.: GCB10356

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
1,3,5-Trimethylbenzene	ND	1.0	98	99	1.0	85	86	1.2	70 - 130	30	
1,3-Dichlorobenzene	ND	5.0	103	101	2.0	93	93	0.0	70 - 130	30	
1,3-Dichloropropane	ND	5.0	96	95	1.0	96	97	1.0	70 - 130	30	
1,4-Dichlorobenzene	ND	5.0	101	100	1.0	88	94	6.6	70 - 130	30	
2,2-Dichloropropane	ND	5.0	118	106	10.7	113	110	2.7	70 - 130	30	
2-Chlorotoluene	ND	5.0	104	102	1.9	104	106	1.9	70 - 130	30	
2-Hexanone	ND	25	73	75	2.7	61	70	13.7	70 - 130	30	m
2-Isopropyltoluene	ND	5.0	102	101	1.0	83	85	2.4	70 - 130	30	
4-Chlorotoluene	ND	5.0	100	101	1.0	98	98	0.0	70 - 130	30	
4-Methyl-2-pentanone	ND	25	82	85	3.6	75	72	4.1	70 - 130	30	
Acetone	ND	10	63	73	14.7	67	56	17.9	70 - 130	30	l,m
Acrylonitrile	ND	5.0	92	93	1.1	95	95	0.0	70 - 130	30	
Benzene	ND	1.0	107	107	0.0	103	104	1.0	70 - 130	30	
Bromobenzene	ND	5.0	105	105	0.0	112	114	1.8	70 - 130	30	
Bromochloromethane	ND	5.0	107	98	8.8	104	101	2.9	70 - 130	30	
Bromodichloromethane	ND	5.0	106	107	0.9	100	100	0.0	70 - 130	30	
Bromoform	ND	5.0	94	95	1.1	86	86	0.0	70 - 130	30	
Bromomethane	ND	5.0	114	109	4.5	114	113	0.9	70 - 130	30	
Carbon Disulfide	ND	5.0	110	107	2.8	94	92	2.2	70 - 130	30	
Carbon tetrachloride	ND	5.0	112	105	6.5	108	105	2.8	70 - 130	30	
Chlorobenzene	ND	5.0	101	101	0.0	94	95	1.1	70 - 130	30	
Chloroethane	ND	5.0	116	111	4.4	119	117	1.7	70 - 130	30	
Chloroform	ND	5.0	102	95	7.1	104	100	3.9	70 - 130	30	
Chloromethane	ND	5.0	110	106	3.7	112	109	2.7	70 - 130	30	
cis-1,2-Dichloroethene	ND	5.0	112	100	11.3	112	109	2.7	70 - 130	30	
cis-1,3-Dichloropropene	ND	5.0	108	108	0.0	93	95	2.1	70 - 130	30	
Dibromochloromethane	ND	3.0	101	103	2.0	102	102	0.0	70 - 130	30	
Dibromomethane	ND	5.0	108	108	0.0	98	99	1.0	70 - 130	30	
Dichlorodifluoromethane	ND	5.0	129	126	2.4	119	118	0.8	70 - 130	30	
Ethylbenzene	ND	1.0	98	98	0.0	90	89	1.1	70 - 130	30	
Hexachlorobutadiene	ND	5.0	104	105	1.0	108	110	1.8	70 - 130	30	
Isopropylbenzene	ND	1.0	102	101	1.0	106	110	3.7	70 - 130	30	
m&p-Xylene	ND	2.0	94	94	0.0	84	83	1.2	70 - 130	30	
Methyl ethyl ketone	ND	5.0	76	77	1.3	69	68	1.5	70 - 130	30	m
Methyl t-butyl ether (MTBE)	ND	1.0	111	112	0.9	114	109	4.5	70 - 130	30	
Methylene chloride	ND	5.0	100	97	3.0	109	100	8.6	70 - 130	30	
Naphthalene	ND	5.0	111	113	1.8	107	109	1.9	70 - 130	30	
n-Butylbenzene	ND	1.0	105	104	1.0	72	73	1.4	70 - 130	30	
n-Propylbenzene	ND	1.0	104	102	1.9	98	99	1.0	70 - 130	30	
o-Xylene	ND	2.0	99	99	0.0	90	91	1.1	70 - 130	30	
p-Isopropyltoluene	ND	1.0	104	102	1.9	78	80	2.5	70 - 130	30	
sec-Butylbenzene	ND	1.0	105	105	0.0	84	85	1.2	70 - 130	30	
Styrene	ND	5.0	94	95	1.1	79	80	1.3	70 - 130	30	
tert-Butylbenzene	ND	1.0	105	104	1.0	93	96	3.2	70 - 130	30	
Tetrachloroethene	ND	5.0	110	106	3.7	91	92	1.1	70 - 130	30	
Tetrahydrofuran (THF)	ND	5.0	95	97	2.1	88	62	34.7	70 - 130	30	m,r
Toluene	ND	1.0	106	107	0.9	96	98	2.1	70 - 130	30	
trans-1,2-Dichloroethene	ND	5.0	113	113	0.0	105	103	1.9	70 - 130	30	
trans-1,3-Dichloropropene	ND	5.0	97	101	4.0	81	80	1.2	70 - 130	30	
trans-1,4-dichloro-2-butene	ND	5.0	96	99	3.1	89	91	2.2	70 - 130	30	
Trichloroethene	ND	5.0	104	104	0.0	96	97	1.0	70 - 130	30	
Trichlorofluoromethane	ND	5.0	104	102	1.9	104	102	1.9	70 - 130	30	
Trichlorotrifluoroethane	ND	5.0	111	109	1.8	101	98	3.0	70 - 130	30	

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Vinyl chloride	ND	5.0	112	109	2.7	110	108	1.8	70 - 130	30
% 1,2-dichlorobenzene-d4	95	%	103	101	2.0	100	100	0.0	70 - 130	30
% Bromofluorobenzene	97	%	98	98	0.0	90	90	0.0	70 - 130	30
% Dibromofluoromethane	106	%	102	95	7.1	103	97	6.0	70 - 130	30
% Toluene-d8	89	%	105	105	0.0	101	100	1.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 444772 (ug/L), QC Sample No: CB10362 (CB10362, CB10364)

### Pesticides

4,4' -DDD	ND	0.003	90	92	2.2				40 - 140	20
4,4' -DDE	ND	0.003	81	83	2.4				40 - 140	20
4,4' -DDT	ND	0.003	91	89	2.2				40 - 140	20
a-BHC	ND	0.002	86	84	2.4				40 - 140	20
Alachlor	ND	0.005	NA	NA	NC				40 - 140	20
Aldrin	ND	0.002	68	73	7.1				40 - 140	20
b-BHC	ND	0.002	93	98	5.2				40 - 140	20
Chlordane	ND	0.050	78	77	1.3				40 - 140	20
d-BHC	ND	0.005	87	94	7.7				40 - 140	20
Dieldrin	ND	0.002	85	85	0.0				40 - 140	20
Endosulfan I	ND	0.005	92	93	1.1				40 - 140	20
Endosulfan II	ND	0.005	92	92	0.0				40 - 140	20
Endosulfan sulfate	ND	0.005	88	88	0.0				40 - 140	20
Endrin	ND	0.005	91	87	4.5				40 - 140	20
Endrin aldehyde	ND	0.005	85	90	5.7				40 - 140	20
Endrin ketone	ND	0.005	81	86	6.0				40 - 140	20
g-BHC	ND	0.002	84	84	0.0				40 - 140	20
Heptachlor	ND	0.005	76	85	11.2				40 - 140	20
Heptachlor epoxide	ND	0.005	89	86	3.4				40 - 140	20
Methoxychlor	ND	0.005	89	92	3.3				40 - 140	20
Toxaphene	ND	0.20	NA	NA	NC				40 - 140	20
% DCBP	95	%	113	124	9.3				30 - 150	20
% TCMX	87	%	89	87	2.3				30 - 150	20

Comment:

A LCS and LCS duplicate were performed instead of a MS and MSD. Alpha and gamma chlordane were spiked and analyzed instead of technical chlordane. Gamma chlordane recovery is reported as chlordane in the LCS and LCSD

QA/QC Batch 443011 (ug/Kg), QC Sample No: CB11110 2X (CB10356, CB10358, CB10360, CB10362, CB10364)

### Pesticides - Soil

4,4' -DDD	ND	1.7	86	63	30.9	75	71	5.5	40 - 140	30
4,4' -DDE	ND	1.7	87	67	26.0	76	73	4.0	40 - 140	30
4,4' -DDT	ND	1.7	87	67	26.0	77	73	5.3	40 - 140	30
a-BHC	ND	1.0	85	64	28.2	75	72	4.1	40 - 140	30
Alachlor	ND	3.3	NA	NA	NC	NA	NA	NC	40 - 140	30
Aldrin	ND	1.0	82	62	27.8	71	68	4.3	40 - 140	30
b-BHC	ND	1.0	87	67	26.0	77	75	2.6	40 - 140	30
Chlordane	ND	33	84	65	25.5	73	69	5.6	40 - 140	30
d-BHC	ND	3.3	83	63	27.4	72	68	5.7	40 - 140	30
Dieldrin	ND	1.0	86	65	27.8	79	75	5.2	40 - 140	30
Endosulfan I	ND	3.3	87	67	26.0	77	74	4.0	40 - 140	30
Endosulfan II	ND	3.3	88	67	27.1	77	74	4.0	40 - 140	30
Endosulfan sulfate	ND	3.3	90	69	26.4	76	72	5.4	40 - 140	30
Endrin	ND	3.3	84	65	25.5	78	75	3.9	40 - 140	30
Endrin aldehyde	ND	3.3	86	64	29.3	92	81	12.7	40 - 140	30

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Endrin ketone	ND	3.3	88	70	22.8	79	76	3.9	40 - 140	30
g-BHC	ND	1.0	83	64	25.9	73	70	4.2	40 - 140	30
Heptachlor	ND	3.3	85	65	26.7	76	78	2.6	40 - 140	30
Heptachlor epoxide	ND	3.3	93	72	25.5	82	79	3.7	40 - 140	30
Methoxychlor	ND	3.3	85	65	26.7	99	78	23.7	40 - 140	30
Toxaphene	ND	130	NA	NA	NC	NA	NA	NC	40 - 140	30
% DCBP	83	%	95	81	15.9	84	80	4.9	30 - 150	30
% TCMX	76	%	89	75	17.1	78	74	5.3	30 - 150	30

QA/QC Batch 443217 (mg/Kg), QC Sample No: CB11291 (CB10356, CB10358, CB10360, CB10362, CB10364)

### TPH by GC (Extractable Products) - Soil

Ext. Petroleum H.C. (C9-C36)	ND	50	78	82	5.0	84	79	6.1	60 - 120	30
% n-Pentacosane	61	%	73	76	4.0	76	71	6.8	50 - 150	30

Comment:

Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

QA/QC Batch 443095 (ug/kg), QC Sample No: CB11325 (CB10356, CB10358, CB10360, CB10362, CB10364)

### Semivolatiles - Soil

1,2,4,5-Tetrachlorobenzene	ND	230	58	58	0.0	57	56	1.8	30 - 130	30
1,2,4-Trichlorobenzene	ND	230	55	56	1.8	58	59	1.7	30 - 130	30
1,2-Dichlorobenzene	ND	180	45	44	2.2	52	54	3.8	30 - 130	30
1,2-Diphenylhydrazine	ND	230	63	60	4.9	59	60	1.7	30 - 130	30
1,3-Dichlorobenzene	ND	230	42	40	4.9	49	49	0.0	30 - 130	30
1,4-Dichlorobenzene	ND	230	43	41	4.8	50	51	2.0	30 - 130	30
2,4,5-Trichlorophenol	ND	230	75	73	2.7	69	70	1.4	30 - 130	30
2,4,6-Trichlorophenol	ND	130	75	73	2.7	70	68	2.9	30 - 130	30
2,4-Dichlorophenol	ND	130	67	67	0.0	66	67	1.5	30 - 130	30
2,4-Dimethylphenol	ND	230	71	69	2.9	70	72	2.8	30 - 130	30
2,4-Dinitrophenol	ND	230	<10	11	NC	63	25	86.4	30 - 130	30
2,4-Dinitrotoluene	ND	130	79	77	2.6	73	76	4.0	30 - 130	30
2,6-Dinitrotoluene	ND	130	77	75	2.6	69	72	4.3	30 - 130	30
2-Chloronaphthalene	ND	230	66	65	1.5	65	64	1.6	30 - 130	30
2-Chlorophenol	ND	230	56	58	3.5	58	61	5.0	30 - 130	30
2-Methylnaphthalene	ND	230	58	58	0.0	59	61	3.3	30 - 130	30
2-Methylphenol (o-cresol)	ND	230	60	60	0.0	60	62	3.3	30 - 130	30
2-Nitroaniline	ND	330	99	96	3.1	83	87	4.7	30 - 130	30
2-Nitrophenol	ND	230	62	62	0.0	61	70	13.7	30 - 130	30
3&4-Methylphenol (m&p-cresol)	ND	230	63	64	1.6	62	65	4.7	30 - 130	30
3,3'-Dichlorobenzidine	ND	130	75	72	4.1	42	50	17.4	30 - 130	30
3-Nitroaniline	ND	330	85	83	2.4	73	79	7.9	30 - 130	30
4,6-Dinitro-2-methylphenol	ND	230	25	27	7.7	82	41	66.7	30 - 130	30
4-Bromophenyl phenyl ether	ND	230	75	72	4.1	65	63	3.1	30 - 130	30
4-Chloro-3-methylphenol	ND	230	75	72	4.1	71	72	1.4	30 - 130	30
4-Chloroaniline	ND	230	70	68	2.9	64	68	6.1	30 - 130	30
4-Chlorophenyl phenyl ether	ND	230	74	70	5.6	66	68	3.0	30 - 130	30
4-Nitroaniline	ND	230	76	73	4.0	68	73	7.1	30 - 130	30
4-Nitrophenol	ND	230	80	76	5.1	69	75	8.3	30 - 130	30
Acenaphthene	ND	230	72	69	4.3	61	61	0.0	30 - 130	30
Acenaphthylene	ND	130	65	62	4.7	62	58	6.7	30 - 130	30
Acetophenone	ND	230	50	50	0.0	51	55	7.5	30 - 130	30
Aniline	ND	330	51	51	0.0	49	52	5.9	30 - 130	30
Anthracene	ND	230	75	72	4.1	62	54	13.8	30 - 130	30
Benz(a)anthracene	ND	230	73	72	1.4	NC	NC	NC	30 - 130	30

## QA/QC Data

SDG I.D.: GCB10356

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
	Blank	RL									
Benzidine	ND	330	53	45	16.3	<10	<10	NC	30 - 130	30	m
Benzo(a)pyrene	ND	130	74	72	2.7	NC	NC	NC	30 - 130	30	
Benzo(b)fluoranthene	ND	160	77	75	2.6	NC	NC	NC	30 - 130	30	
Benzo(ghi)perylene	ND	230	72	70	2.8	NC	NC	NC	30 - 130	30	
Benzo(k)fluoranthene	ND	230	79	76	3.9	NC	NC	NC	30 - 130	30	
Benzoic Acid	ND	330	<10	<10	NC	<10	<10	NC	30 - 130	30	l,m
Benzyl butyl phthalate	ND	230	79	78	1.3	64	61	4.8	30 - 130	30	
Bis(2-chloroethoxy)methane	ND	230	64	65	1.6	61	66	7.9	30 - 130	30	
Bis(2-chloroethyl)ether	ND	130	48	48	0.0	50	55	9.5	30 - 130	30	
Bis(2-chloroisopropyl)ether	ND	230	47	46	2.2	48	53	9.9	30 - 130	30	
Bis(2-ethylhexyl)phthalate	ND	230	84	83	1.2	72	65	10.2	30 - 130	30	
Carbazole	ND	230	75	73	2.7	72	61	16.5	30 - 130	30	
Chrysene	ND	230	76	74	2.7	NC	NC	NC	30 - 130	30	
Dibenz(a,h)anthracene	ND	130	77	76	1.3	65	84	25.5	30 - 130	30	
Dibenzofuran	ND	230	68	66	3.0	66	59	11.2	30 - 130	30	
Diethyl phthalate	ND	230	76	73	4.0	68	69	1.5	30 - 130	30	
Dimethylphthalate	ND	230	76	73	4.0	67	68	1.5	30 - 130	30	
Di-n-butylphthalate	ND	670	83	80	3.7	65	64	1.6	30 - 130	30	
Di-n-octylphthalate	ND	230	84	83	1.2	72	65	10.2	30 - 130	30	
Fluoranthene	ND	230	77	74	4.0	NC	NC	NC	30 - 130	30	
Fluorene	ND	230	73	70	4.2	60	60	0.0	30 - 130	30	
Hexachlorobenzene	ND	130	76	72	5.4	62	55	12.0	30 - 130	30	
Hexachlorobutadiene	ND	230	54	54	0.0	57	58	1.7	30 - 130	30	
Hexachlorocyclopentadiene	ND	230	53	53	0.0	25	22	12.8	30 - 130	30	m
Hexachloroethane	ND	130	41	41	0.0	47	48	2.1	30 - 130	30	
Indeno(1,2,3-cd)pyrene	ND	230	75	73	2.7	NC	NC	NC	30 - 130	30	
Isophorone	ND	130	59	58	1.7	55	59	7.0	30 - 130	30	
Naphthalene	ND	230	57	62	8.4	60	62	3.3	30 - 130	30	
Nitrobenzene	ND	130	55	56	1.8	57	63	10.0	30 - 130	30	
N-Nitrosodimethylamine	ND	230	41	40	2.5	52	55	5.6	30 - 130	30	
N-Nitrosodi-n-propylamine	ND	130	60	60	0.0	59	65	9.7	30 - 130	30	
N-Nitrosodiphenylamine	ND	130	77	74	4.0	70	70	0.0	30 - 130	30	
Pentachloronitrobenzene	ND	230	72	71	1.4	61	58	5.0	30 - 130	30	
Pentachlorophenol	ND	230	69	66	4.4	75	56	29.0	30 - 130	30	
Phenanthrene	ND	130	75	72	4.1	NC	NC	NC	30 - 130	30	
Phenol	ND	230	59	61	3.3	59	62	5.0	30 - 130	30	
Pyrene	ND	230	78	75	3.9	NC	NC	NC	30 - 130	30	
Pyridine	ND	230	25	24	4.1	39	38	2.6	30 - 130	30	l
% 2,4,6-Tribromophenol	56	%	75	72	4.1	66	65	1.5	30 - 130	30	
% 2-Fluorobiphenyl	45	%	59	57	3.4	56	56	0.0	30 - 130	30	
% 2-Fluorophenol	35	%	50	51	2.0	51	55	7.5	30 - 130	30	
% Nitrobenzene-d5	38	%	49	49	0.0	51	56	9.3	30 - 130	30	
% Phenol-d5	42	%	58	59	1.7	56	60	6.9	30 - 130	30	
% Terphenyl-d14	61	%	70	68	2.9	57	57	0.0	30 - 130	30	

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.

m = This parameter is outside laboratory MS/MSD specified recovery limits.

r = This parameter is outside laboratory RPD specified recovery limits.

# QA/QC Data

SDG I.D.: GCB10356

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
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If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference



Phyllis Shiller, Laboratory Director  
August 29, 2018



Wednesday, August 29, 2018

Criteria: CT: GAM, RC

State: CT

## Sample Criteria Exceedances Report

### GCB10356 - WSP-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CB10362	\$PEST_SMR	4,4' -DDT	CT / RSR GA,GAA (mg/kg) / APS Organics	18	7.6	3	3	ug/Kg
CB10362	\$PEST_SMR	4,4' -DDE	CT / RSR GA,GAA (mg/kg) / APS Organics	28	7.6	3	3	ug/Kg
CB10364	\$PEST_SMR	4,4' -DDT	CT / RSR GA,GAA (mg/kg) / APS Organics	5.1	1.5	3	3	ug/Kg
CB10364	\$PEST_SMR	4,4' -DDE	CT / RSR GA,GAA (mg/kg) / APS Organics	4.1	1.5	3	3	ug/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



## REASONABLE CONFIDENCE PROTOCOL LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

**Laboratory Name:** Phoenix Environmental Labs, Inc.

**Client:** WSP USA

**Project Location:** CTDAS-CCSU

**Project Number:**

**Laboratory Sample ID(s):** CB10356-CB10365

**Sampling Date(s):** 8/13/2018

**List RCP Methods Used (e.g., 8260, 8270, et cetera)** 1311/1312, 6010, 7470/7471, 8081, 8082, 8151, 8260, 8270, ETPH

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1B	<u>VPH and EPH methods only:</u> Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
2	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? See Sections: Herbicide Narration, PEST Narration, SVOA Narration, VOA Narration.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were reporting limits specified or referenced on the chain-of-custody?  b) Were these reporting limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

**Authorized Signature:**  **Position:** Project Manager

**Printed Name:** Maryam Taylor **Date:** Wednesday, August 29, 2018

**Name of Laboratory** Phoenix Environmental Labs, Inc.

**This certification form is to be used for RCP methods only.**



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

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### ***SDG Comments***

#### Metals Analysis:

The client requested a site specific list of elements which is shorter than the 6010 RCP list.

The holding time for pH is immediate. The sample was analyzed in the laboratory on receipt and may be considered out of hold.

### ***Cyanide Narration***

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### **Instrument:**

##### **LACHAT 08/15/18-1**

Dustin Harrison, Greg Danielewski, Chemist 08/15/18

CB10356

The samples were distilled in accordance with the method.  
The initial calibration met criteria.

The calibration check standards (ICV,CCV) were within 15% of true value and were analyzed at a frequency of one per ten samples.  
The continuing calibration blanks (ICB,CCB) had concentrations less than the reporting level.

The method blank, laboratory control sample (LCS), and matrix spike were distilled with the samples.

##### **LACHAT 08/16/18-1**

Dustin Harrison, Greg Danielewski, Chemist 08/16/18

CB10358, CB10360

The samples were distilled in accordance with the method.  
The initial calibration met criteria.

The calibration check standards (ICV,CCV) were within 15% of true value and were analyzed at a frequency of one per ten samples.  
The continuing calibration blanks (ICB,CCB) had concentrations less than the reporting level.

The method blank, laboratory control sample (LCS), and matrix spike were distilled with the samples.

##### **LACHAT 08/21/18-1**

Dustin Harrison, Greg Danielewski, Chemist 08/21/18

CB10362, CB10364

The samples were distilled in accordance with the method.  
The initial calibration met criteria.

The calibration check standards (ICV,CCV) were within 15% of true value and were analyzed at a frequency of one per ten samples.  
The continuing calibration blanks (ICB,CCB) had concentrations less than the reporting level.

The method blank, laboratory control sample (LCS), and matrix spike were distilled with the samples.

#### **QC (Batch Specific):**

##### **Batch 443188 (CB10829)**

CB10356

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## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

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### ***Cyanide Narration***

All LCS recoveries were within 80 - 120 with the following exceptions: None.  
Additional: LCS acceptance range is 80-120% for soils MS acceptance range 75-125% for soils

#### **Batch 443440 (CB10360)**

CB10358, CB10360

All LCS recoveries were within 80 - 120 with the following exceptions: None.  
Additional: LCS acceptance range is 80-120% for soils MS acceptance range 75-125% for soils

#### **Batch 444056 (CB15111)**

CB10362, CB10364

All LCS recoveries were within 80 - 120 with the following exceptions: None.  
Additional: LCS acceptance range is 80-120% for soils MS acceptance range 75-125% for soils

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### ***ETPH Narration***

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### **Instrument:**

**AU-FID1 08/15/18-1** Jeff Bucko, Chemist 08/15/18

CB10356, CB10358, CB10362

The initial calibration (ETPH723I) RSD for the compound list was less than 30% except for the following compounds: None.  
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

**AU-FID1 08/16/18-1** Jeff Bucko, Chemist 08/16/18

CB10364

The initial calibration (ETPH723I) RSD for the compound list was less than 30% except for the following compounds: None.  
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

**AU-FID22 08/15/18-1** Jeff Bucko, Chemist 08/15/18

CB10360

The initial calibration (ETPH802I) RSD for the compound list was less than 30% except for the following compounds: None.  
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

#### **QC (Batch Specific):**

##### **Batch 443217 (CB11291)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 60 - 120 with the following exceptions: None.

All LCSD recoveries were within 60 - 120 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

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### ***Herbicide Narration***

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**Environmental Laboratories, Inc.**  
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## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

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### Herbicide Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443109 (Samples: CB10356, CB10358, CB10360, CB10362, CB10364): -----**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Dalapon)**

**Instrument:**

**AU-ECD12 08/15/18-1** Carol Wohlmuth, Chemist 08/15/18

CB10356, CB10358, CB10360, CB10362, CB10364

The initial calibration (HRB807AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (HRB807BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 15% except for the following compounds:None.

**QC (Batch Specific):**

**Batch 443109 (CB10041)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: Dalapon(34.2%)

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### Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

**Instrument:**

**MERLIN 08/15/18 08:34** Rick Schweitzer, Chemist 08/15/18

CB10356, CB10358, CB10360, CB10362, CB10364

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.

The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

**QC (Batch Specific):**

**Batch 443190 (CB10180)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.



**Environmental Laboratories, Inc.**  
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Tel. (860) 645-1102 Fax (860) 645-0823



## Certification Report

August 29, 2018

SDG I.D.: GCB10356

---

### ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### Instrument:

**ARCOS 08/15/18 10:44** Emily Kolominskaya, Tina Hall, Chemist 08/15/18

CB10356, CB10358, CB10360, CB10362, CB10364

Additional criteria for CCV and ICSAB:

Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB). The linear range is defined daily by the calibration range.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

#### QC (Batch Specific):

##### **Batch 443110 (CB10180)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 75 - 125 with the following exceptions: None.

---

### PCB Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

#### Instrument:

**AU-ECD3 08/15/18-1** Adam Werner, Chemist 08/15/18

CB10356, CB10358

The initial calibration (PC605AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (PC605BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 15% except for the following compounds: None.

**AU-ECD6 08/15/18-1** Adam Werner, Chemist 08/15/18

CB10360, CB10362, CB10364

The initial calibration (PC723AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (PC723BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 15% except for the following compounds: None.

#### QC (Batch Specific):

##### **Batch 443103 (CB10184)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

---

### PEST Narration



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## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

---

### PEST Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443011 (Samples: CB10356, CB10358, CB10360, CB10362, CB10364): -----**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (4,4' -DDD)**

#### Instrument:

**AU-ECD35 08/15/18-1** Carol Wohlmuth, Chemist 08/15/18

CB10356, CB10358, CB10360, CB10362, CB10364

The initial calibration (PS808AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (PS808BI) RSD for the compound list was less than 20% except for the following compounds: None.

The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.

The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.

The continuing calibration %D for the compound list was less than 20% except for the following compounds:

Samples: CB10360, CB10362, CB10364

Preceding CC 815B029 - None.

Succeeding CC 815B042 - 4,4'-DDT -21%L (20%)

A low "1A" standard was run after the samples to demonstrate capability to detect any compounds outside of the CC acceptance criteria. All reported samples were ND for the affected compounds.

**AU-ECD35 08/27/18-1** Carol Wohlmuth, Chemist 08/27/18

CB10362, CB10364

The initial calibration (PS808AI) RSD for the compound list was less than 20% except for the following compounds: None.

The initial calibration (PS808BI) RSD for the compound list was less than 20% except for the following compounds: None.

The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.

The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.

The continuing calibration %D for the compound list was less than 20% except for the following compounds:None.

#### QC (Batch Specific):

**Batch 443011 (CB11110)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: 4,4' -DDD(30.9%)

**Batch 444772 (CB10362)**

CB10362, CB10364

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

A LCS and LCS duplicate were performed instead of a MS and MSD. Alpha and gamma chlordane were spiked and analyzed instead of technical chlordane. Gamma chlordane recovery is reported as chlordane in the LCS and LCSD

---

### SVOA Narration



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## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

---

### SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443095 (Samples: CB10356, CB10358, CB10360, CB10362, CB10364): -----**

**One or more analytes is below the method criteria. A low bias for these analytes is possible. (2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, Pyridine)**

**The LCS/LCSD recoveries for one or more analytes is below the method criteria. A low bias is likely. (Benzoic Acid)**

#### Instrument:

**CHEM06 08/14/18-1** Keith Aloisa, Chemist 08/14/18

CB10356, CB10358, CB10360, CB10362, CB10364

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

Initial Calibration Verification (CHEM06/SPLIT\_0814):

97% of target compounds met criteria.

The following compounds had %RSDs >20%: 2,4-Dinitrophenol 31% (20%), 4,6-Dinitro-2-methylphenol 30% (20%)

The following compounds did not meet recommended response factors: 2-Nitrophenol 0.064 (0.1), Hexachlorobenzene 0.086 (0.1)

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM06/0814\_22-SPLIT\_0814):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

99% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: 2-Nitrophenol 0.065 (0.1), Hexachlorobenzene 0.083 (0.1)

The following compounds did not meet minimum response factors: None.

#### QC (Batch Specific):

##### **Batch 443095 (CB11325)**

CB10356, CB10358, CB10360, CB10362, CB10364

All LCS recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<10%), 4,6-Dinitro-2-methylphenol(25%), Benzoic Acid(<10%), Pyridine(25%)

All LCSD recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(11%), 4,6-Dinitro-2-methylphenol(27%), Benzoic Acid(<10%), Pyridine(24%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

---

### VOA Narration





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## RCP Certification Report

August 29, 2018

SDG I.D.: GCB10356

---

### VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 443237 (Samples: CB10357, CB10359, CB10361, CB10363, CB10365): -----**

**\*\*\* This was most likely an error and needs to be corrected before report is sent. (Acetone)**

**The MS/MSD RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Tetrahydrofuran (THF))**

#### Instrument:

**CHEM18 08/14/18-2**

Jane Li, Chemist 08/14/18

CB10357, CB10359, CB10361, CB10363, CB10365

Initial Calibration Verification (CHEM18/VT-M0814):

95% of target compounds met criteria.

The following compounds had %RSDs >20%: 2-Hexanone 33% (20%), Acetone 39% (20%), Methyl Ethyl Ketone 34% (20%), Methylene chloride 23% (20%)

The following compounds did not meet recommended response factors: None.

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM18/0814M17-VT-M0814):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

100% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet minimum response factors: None.

#### QC (Batch Specific):

**Batch 443237 (CB10355)**

CB10357, CB10359, CB10361, CB10363, CB10365

All LCS recoveries were within 70 - 130 with the following exceptions: Acetone(63%)

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%.

---

### Temperature Narration

The samples were received at 3.7C with cooling initiated.

(Note acceptance criteria for relevant matrices is above freezing up to 6°C)



CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040  
 Email: info@phoenixlabs.com Fax (860) 645-0823  
 Client Services (860) 645-8726

Customer: WSP USA  
 Address: 6 EXECUTIVE DRIVE  
FARMINGTON CT 06032  
 Project: CTPAS - CTSU  
 Report to: M. Suwa  
 Invoice to: M. Suwa

Cooler: Yes  No   
 Coolant: IPK  ICE   
 Temp: 37 Pg of 1  
 Data Delivery/Contact Options:  
 Fax:   
 Phone: 860-645-8822-7326  
 Email: michael.stump@wsl.com

This section MUST be completed with Bottle Quantities.

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	M920 VOL	M921 VOL	M922 VOL	TRIT METHS	TRIT METLS	WASTE CHAMK *	GL Amber Vial 100mL [As Is] [H2O]	GL Amber Vial 250mL [As Is] [H2O]	GL Amber Vial 500mL [As Is] [H2O]	PL HNO3 250mL [As Is] [H2O]	PL HNO3 500mL [As Is] [H2O]	Bacteria Bottle with Bacteri Bottle as is
103350	B-4 (1-5)	S	8/13/18	1530	X	X	X	X	X							
103357	B-4 (4)			1525	X	X	X	X	X							
103358	B-5 (1-5)			0900	X	X	X	X	X							
103359	B-5 (4,5)			0855	X	X	X	X	X							
103100	B-5 (5-8,5)			1200	X	X	X	X	X							
103101	B-5 (3,5)			1155	X	X	X	X	X							
103102	B-7 (1-5)			0900	X	X	X	X	X							
103103	B-7 (2,5)			0900	X	X	X	X	X							
103104	B-8 (1-5)			1500	X	X	X	X	X							
103105	B-8 (3,5)			1455	X	X	X	X	X							

Relinquished by: WSP BRIDGE  
 Accepted by: WSP BRIDGE  
 Date: 8/13/18 Time: 1700  
 Direct Exposure (Residential)  GW  Other   
 Turnaround:  1 Day  2 Days  3 Days  Standard  Other  
 Comments: Special Requirements of Regulations:  
WORK FOR CTPAS - DAS RATES APPLY - NOSMEL RAY  
WASTE CHARACTERIZATION  
M900 CORROSION M905A PAINT FILTERED  
REACTIVITY M1010 FLASHPOINT

MA  
 MCP Certification  
 GW-1  
 GW-2  
 GW-3  
 S-1  
 S-2  
 S-3  
 MWRA eSMART  
 Other  
 IIC DEC  
 Other  
 Residual DEC  
 Other  
 RCP Cert  
 GW Protection  
 SW Protection  
 GA Mobility  
 GB Mobility  
 Residential DEC  
 IIC DEC  
 Other  
 Data Format  
 Excel  
 PDF  
 GIS/Key  
 EQUIS  
 Other  
 Data Package  
 Tier II Checklist  
 Full Data Package\*  
 Phoenix Std Report  
 Other  
 State where samples were collected: CT  
 \* SURCHARGE APPLIES

## Client Services

---

**From:** Susca, Michael <Michael.Susca@wsp.com>  
**Sent:** Thursday, August 23, 2018 1:55 PM  
**To:** Client Services  
**Subject:** RE: Phoenix Labs - GCB10356, CTDAS-CCSU

Please analyze the following samples for SPLP pesticides:

CB10362, B-7(1-5)  
CB10364, B-8(1-5)

Thank you.

**Michael Susca, CPG, LEP**  
Supervising Hydrogeologist

Phone: +1 475 882 1736  
Email: [Michael.susca@wsp.com](mailto:Michael.susca@wsp.com)  
Please note I have a new email address

WSP USA  
6 Executive Drive  
Farmington, Connecticut 06032

[wsp.com](http://wsp.com)

Leggette, Brashears & Graham is now WSP.

**From:** [clientservices@phoenixlabs.com](mailto:clientservices@phoenixlabs.com) [<mailto:clientservices@phoenixlabs.com>]  
**Sent:** Wednesday, August 22, 2018 8:52 PM  
**To:** Susca, Michael <Michael.Susca@wsp.com>  
**Subject:** Phoenix Labs - GCB10356, CTDAS-CCSU - Report Ready

Delivery group GCB10356 (CTDAS-CCSU ) for the following samples:

CB10356 - B-4 (1-5)  
CB10357 - B-4 (4)  
CB10358 - B-5 (1-5)  
CB10359 - B-5 (4.5)  
CB10360 - B-5 (5-35.5)  
CB10361 - B-5 (35)  
CB10362 - B-7 (1-5)  
CB10363 - B-7 (2.5)  
CB10364 - B-8 (1-5)  
CB10365 - B-8 (3.5)

is available for review. Please click the following link to view report data.

[www.PhoenixLabs.com](http://www.PhoenixLabs.com)

Note: The default password is your email address. You may change it after logging in.

---

Please take a moment to give us some feedback on your experience with Phoenix Environmental Laboratories, Inc. Your input is valuable to us!

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Phoenix Environmental Laboratories, Inc.

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Manchester, CT 06374

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---

Please do not reply to this email.  
cc:d.msusca@lbget.com



**ATTACHMENT III**  
**SOIL EXCAVATION (EXCESS SOIL) ESTIMATES**



All calculations and estimates presented below are based on the fifty (50) percent design development drawings and specifications prepared by Desman, Inc. and others dated February 28, 2019. The proposed parking garage footprint is approximately 52,885 square feet and will be constructed on a concrete slab-on-grade with multiple footings, as shown on the drawings. WSP estimates for soil excavation quantities during construction activities are as follows:

### **Foundation**

Accounting strictly for the footings included in the footing schedule on Drawing S-101, the excess soil volume is estimated at 695 cubic yards (CY). An additional allowance of 30% was included in the calculations for associated foundational walls, steps, columns, etc., bringing the total excavation estimate for the foundation to 904 CY. The following assumptions were made for this calculation:

1. Excavated soils are reused for backfill around all foundation items. Actual soil reuse may require approval from the Geotechnical Engineer.
2. Dimensions and elevations for foundational walls, steps, columns, etc., were not specified in the foundation plan, therefore the excavation quantity associated with these items was assumed to be 30% of footing requirements.
3. Ground Improvement Note 7 on Drawing S-001 specifies 24-inch diameter piers that extend at least 15 feet below footings. Details regarding location and quantity of these piers were not called out in the foundation plan, but a preliminary estimate of 3,000 CY of excess soil was provided by the architect.
4. Foundation Note 2 on Drawing S-001 states all footings will be placed on undisturbed existing soil, therefore, over-excavation associated with subgrade preparation was not included in this estimate. The slab-on-grade was also assumed to be placed directly on compacted native soil, therefore excavation quantities for slab subbase was not included in this estimate.

### **Drainage**

The proposed garage includes approximately 860 linear feet (LF) of high density polyethylene (HDPE) piping, 20 LF of reinforced concrete piping (RCP), 10 LF of polyvinyl chloride (PVC) piping. The trench excavation quantities were calculated using the details on Drawing CG501. The estimates for the HDPE piping, RCP and PVC piping are 190 CY, 5 CY and 1 CY, respectively, and assume the reuse of soil at all areas unless otherwise specified. The drainage system also includes multiple drains, catch basins and manholes. The soil excavation quantity for these items is approximately 60 CY. The total excavation quantity for the proposed drainage system is estimated at 256 CY.

### **Site Features and Utilities**

The improvements will include concrete sidewalks along Paul Manafort Sr. Drive and between the proposed garage and Charter Oak College. The excavation quantity associated with the sidewalk construction is approximately 160 CY. The reinforced gravel emergency access road on the southeast corner of the garage will require an additional 35 CY of excavation.

The proposed site plan includes the widening of a section of Paul Manafort Sr. Drive to include a bike lane, turn lane and apron for garage entry/exit. Approximately 220 CY of soil will be excavated during the roadway widening.



An exterior parking lot will be constructed on the east side of the garage (adjacent to Charter Oak College) requiring an estimated excavation of 140 CY. This parking lot was assumed to be constructed of bituminous concrete as per Detail 6 on Drawing CS501.

The garage will require an on-site transformer mounted on a concrete pad. Approximately 20 CY of soil will be excavated during the installation of the concrete pad, surrounding bollards and 49 LF of 4-inch PVC conduit. The transformer pad footprint is approximately 8 feet by 7 feet (actual dimensions not specified). An excavation depth of 2 feet was assumed for slab installation and subbase. The PVC conduit trench excavation quantity was calculated using Detail 6 on Drawing CU501, assuming a trench width of 2 feet.

Approximately 25 CY of soil will be excavated during the installation of a 1,500-gallon oil-water separator. This estimate includes all associated 6-inch PVC piping and manhole that will tie into an existing 8-inch clay pipe. This quantity was calculated using details on Drawing CU501, assuming an excavation to a depth of 8 feet.

A 6-inch ductile iron pipe (DIP) will be installed outside the southwest corner of the garage to provide water for the fire suppression system and will require an estimated 40 CY of soil.

The soil excavation requirements for all site features (not including grade changes) and utilities (not including relocations) described above will be approximately 635 CY.

### **Landscaping and Planting**

Approximately 110 CY of soil will be excavated during the soil preparation associated with final planting and seeding. Per Soil Note 1 on DWG L2.1, soil preparation areas are subject to change. This estimate assumes an 18-inch excavation, as per Detail 7 on DWG LD1.0, in all plant bed areas (approximately 2,000 sq. ft.) specified on DWG L2.1.

### **Changes in Grade**

The parking garage will be constructed upon a 5-inch slab on grade with a top of concrete (TOC) elevation of approximately 160 feet (datum not specified). Given the existing topography, cut and fill earthwork will be required to achieve this final slab elevation. Most the site is below the proposed elevation and approximately 1,820 CY of fill will be required to build up the existing grade. Additionally, approximately 50 CY of soil will need to be excavated at existing high points above the proposed slab elevations. The following assumptions were included in this calculation.

1. Elevations are based on the “Charter Oak State College Boundary and Topographic Survey” dated January 23, 2018.
2. The proposed slab on grade TOC elevation was assumed to be 160 feet across the entire footprint. Subtracting the 5-inch slab thickness, the fill elevation is 159.58.
3. An additional 30% was added to the calculated fill volume to accommodate compaction requirements.

The total of the above estimated volume is approximately 2,000 CY. The following items were not included in this estimate: relocation of existing utilities and additional fill associated with compaction during backfill activities.

An itemized summary of the excavation-volume estimates can be found below.



Item No.	Description	Soil Quantity (Cubic Yards)
<b>FOUNDATION</b>		
1	Footing F-6	4
2	Footing F-8	32
3	Footing F-10	15
4	Footing F-13	94
5	Footing S5x10	82
6	Footing S7x1.5	140
7	Footing M-1	29
8	Footing M-2	29
9	Footing F36x16	128
10	Footing F40x16	142
<b>SUBTOTAL</b>		695
11	Allowance for Foundational Walls, Columns, Steps, etc. (30% of Footings)	209
12	Allowance for Piers	3,000
<b>FOUNDATION TOTAL</b>		3,904
<b>DRAINAGE</b>		
13	HDPE Piping	191
14	RCP Piping	6
15	PVC Piping	1
16	Yard Drains	3
17	Catch Basins	28
18	Manholes	27
<b>DRAINAGE TOTAL</b>		256
<b>SITE AND UTILITIES</b>		
19	Concrete Sidewalks	156
20	Roadway (Bike Lane, Turn Lane, Garage Entrance)	220
21	Charter Oak College Lot	139
22	Reinforced Gravel Emergency Access Road	34
23	Concrete Pad for Transformer	4
24	Bollards	5





<b>SITE AND UTILITIES (cont'd)</b>		
25	Transformer Conduit	8
26	Fire Protection Water Piping	37
27	Oil-Water Separator	20
28	Oil-Water Separator Piping	5
29	SMH-01	7
<b>SITE AND UTILITIES TOTAL</b>		635
<b>LANDSCAPING AND PLANTING</b>		
30	Excavation for Planting Mix Backfill	110
<b>LANDSCAPING AND PLANTING TOTAL</b>		110
<b>CHANGES IN GRADE/CUTS</b>		
31	Cut Volume	50
<b>CHANGES IN GRADE/CUT VOLUME TOTAL</b>		50
<b>PROJECT TOTAL - ESTIMATED CUTS (rounded)</b>		5,000
<b>CHANGES IN GRADE/FILL</b>		
32	Estimated Fill Volume	1,820
<b>CHANGES IN GRADE/FILL VOLUME TOTAL</b>		1,820
<b>PROJECT TOTAL - ESTIMATED FILLS (rounded)</b>		1,800
<b>PROJECT SUMMARY</b>		
<b>PROJECT TOTAL - ESTIMATED CUTS (rounded)</b>		5,000
<b>PROJECT TOTAL - ESTIMATED FILLS (rounded)</b>		1,800
<b>ESTIMATED NET (EXCESS) SOIL (assuming cut soils are suitable for reuse)</b>		3,200

Note: Does not include soil excavation for existing utility relocations or additional fill associated with compaction during backfill activities

# **Section 50 40 00 Subsurface Geotechnical Report**

**FREEMAN**  
C O M P A N I E S  
LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

**Geotechnical Report  
Willard Diloreto Parking Garage  
Central Connecticut State University  
New Britain, Connecticut**

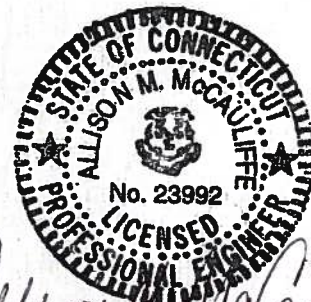
**January 18, 2019**

**Freeman File No.: 2018-0110**

*Prepared for:*  
**Desman Design Management  
55 Capitol Boulevard  
4<sup>th</sup> Floor  
Hartford, Connecticut 06067**

*Prepared by:*

**Freeman Companies, LLC  
36 John Street  
Hartford, CT 06106**



*Allison M. McCauliffe* 1/18/19  
Allison M. McCauliffe, P.E.  
Senior Geotechnical Engineer/Project Manager

**TABLE OF CONTENTS**

1.0 INTRODUCTION ..... 1  
 1.1 Summary..... 1  
 1.2 Scope of Work..... 1  
 1.3 Authorization ..... 1  
 1.4 Elevation Datum ..... 1  
 2.0 SITE AND PROJECT DESCRIPTION..... 1  
 2.1 Site Description..... 1  
 2.2 Project Description..... 1  
 3.0 EXPLORATIONS AND SUBSURFACE CONDITIONS ..... 2  
 3.1 Subsurface Explorations ..... 2  
 3.2 Laboratory Testing..... 2  
 3.3 Subsurface Conditions ..... 2  
 4.0 GEOTECHNICAL ENGINEERING RECOMMENDATIONS ..... 3  
 4.1 Foundation Design..... 3  
 4.2 Floor Slab Design ..... 4  
 4.3 Seismic Design ..... 5  
 4.4 Backfill Materials ..... 5  
 4.5 Reuse of Existing Soils..... 5  
 5.0 CONSTRUCTION CONSIDERATIONS ..... 5  
 5.1 Subgrade Preparation..... 5  
 5.2 Excavation and Dewatering..... 6  
 5.3 Aggregate Piers ..... 6  
 5.4 Pile Installation ..... 6  
 5.5 Settlement Monitoring For Aggregate Piers..... 6  
 5.6 Freezing Conditions ..... 7  
 6.0 FUTURE SERVICES AND LIMITATIONS..... 7  
 6.1 Construction Services..... 7  
 6.2 Limitations ..... 7

**LIST OF ATTACHMENTS**

Tables

1. Table 1 Subsurface Data

Figures

1. Site Location Map
2. Subsurface Exploration Location Plan

Appendices

- A. Test Boring Logs
- B. Results of Laboratory Testing

## **1.0 INTRODUCTION**

### **1.1 Summary**

This report presents the results of subsurface explorations and our geotechnical design and construction recommendations for the proposed Willard Diloreto parking garage at the Central Connecticut State University (CCSU) in New Britain, Connecticut. Subsurface conditions consist of Fill, Glaciofluvial Deposits, and Glacial Till overlying Bedrock.

In summary, we recommend that the building be constructed on conventional shallow foundations following ground improvement activities utilizing aggregate piers or on H-piles driven to end bearing on bedrock. Our detailed recommendations follow.

### **1.2 Scope of Work**

Freeman Companies conducted the following work:

- Engaged a subsurface exploration contractor to conduct test borings at the site;
- Provided technical monitoring of the explorations;
- Arranged for a testing laboratory to conduct laboratory soil tests;
- Evaluated the subsurface conditions and prepared this report containing geotechnical design recommendations and construction considerations.

### **1.3 Authorization**

The work was completed in accordance with our proposal dated August 24, 2018.

### **1.4 Elevation Datum**

Elevations are in feet and reference the NAVD-88.

## **2.0 SITE AND PROJECT DESCRIPTION**

### **2.1 Site Description**

The site is located on the CCSU campus, on Paul J. Manafort Drive, located in New Britain Connecticut, as shown on Figure 1, Site Location Map. The proposed parking garage will be located in an existing at grade paved parking lot. Ground surface is relatively flat, ranging from Elevation 158 feet in the central portion of the lot and rising to Elevation 160 feet at the western and eastern limits of the lot. The site was also once occupied by numerous houses, which may or may not still have their foundations buried at the site. Numerous utilities are also located within the parking area.

### **2.2 Project Description**

The project consists of the construction of a three to four story parking garage. The footprint will be approximately 57,000 square feet (sf). There is no planned below grade space.

### **3.0 EXPLORATIONS AND SUBSURFACE CONDITIONS**

#### **3.1 Subsurface Explorations**

Ten test borings (B-1 to B-8 and S-1 and S-2) were drilled by New England Borings, Inc., of Glastonbury, Connecticut on August 13 through 16, 2018. Borings were advanced with 4 inch diameter flush joint casing to depth ranging from 34 feet to 50 feet. Standard Penetration Tests (SPTs) were taken semi-continuously through fill and at maximum 5 foot intervals thereafter. Borings were terminated in the in situ soils, refusal on probable bedrock, or with a bedrock core.

Boreholes, not finished as monitoring wells, were backfilled upon completion with cuttings and cement-bentonite grout. A bituminous cold-patch was placed at ground surface in paved areas.

Exploration locations were determined by taping from existing site features and are considered approximate. A Freeman Companies geotechnical engineer observed the drilling and prepared the field boring logs with soil descriptions based on the visual observation of the samples. Test boring logs are included in Appendix A and locations are shown on Figure 2, Subsurface Exploration Location Plan.

#### **3.2 Laboratory Testing**

Laboratory tests were conducted to aid in determining engineering properties of the subsurface materials. Tests included eight grain size analyses and one unconfined compressive strength of rock. Laboratory testing was conducted by Geotesting Express, of Acton, Massachusetts. Results are provided in Appendix B.

#### **3.3 Subsurface Conditions**

Subsurface conditions encountered in the borings consisted of Fill, Glaciofluvial Deposits, and Glacial Till overlying Bedrock. Conditions are known only at the boring location and may differ around the site. A summary of the conditions is provided in the attached Table 1.

THICKNESS (FT)	GENERALIZED DESCRIPTION
0.2 to 0.3	<b>Pavement</b>
3.8 to 14.3	<b>Fill</b> – Loose to very dense, brown to gray-brown to red-brown, coarse to fine SAND, some to little Gravel, some to little Silt, construction debris (wood, concrete, brick, asphalt) noted in borings B-3 and B-5
6 to 20	<b>Glaciofluvial Deposit</b> – Medium dense to very dense, light brown to brown, fine SAND, little to trace Silt, varying to coarse to fine SAND, some to trace Gravel, little to trace Silt,
8.5 to 15	<b>Glacial Till</b> – Medium dense to very dense, brown to red-brown, coarse to fine SAND, and Gravel, some Silt, varying to coarse to fine GRAVEL, some coarse to fine Sand, some Silt.
--	<b>Bedrock</b> – Red-brown, coarse, ARKOSE, thinly bedded, moderately fractured, highly weathered, weak to medium strong, 15 degree bedding angle, some vertical fractures. Rock Quality Designation (RQD) 7 percent to 43 percent – very poor to poor.

**Groundwater** - Groundwater was encountered at approximately 15 feet to 16 feet below existing ground surface during drilling. Stabilized groundwater readings, taken from the monitoring wells, show that groundwater ranges from 16 feet to 18 feet below ground surface, corresponding to Elevation 140.5 feet to 144 feet. Groundwater levels are expected to vary with season, temperature, precipitation, construction activities at the site, and other factors.

#### 4.0 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

##### 4.1 Foundation Design

Subsurface conditions consist of Fill, Glaciofluvial Deposits, and Glacial Till overlying weathered bedrock and bedrock. Fill depths at the site range from approximately 4 feet to 15 feet, with an average depth of 9.5 feet. The deepest areas are located along the outer northern and western footprint of the proposed garage. In general, these fill depths are thick enough to exclude over-excavation and replacement operations as an option given the significant cost associated with the large amount of fill that would be necessary as well as the necessity of temporary excavation support.

As stated previously, the site did have other structures prior to it being converted to a parking lot. At this time, it is unknown if the foundations for those structures are still buried at the site. Therefore, we recommend that test pits be conducted in the locations of the previous structures to determine if the foundations are still present. If they are still present it is recommended that they are removed prior to installation of the foundation support alternatives presented below to limit obstructions.

The following options are presented for consideration for foundation support:

### **Ground Improvement - Aggregate Piers**

Given that the fill is of variable density, and the site soils, both the fill and natural, are granular, ground improvement is a preferred alternative for foundation support. Specifically, aggregate piers are recommended for ground improvement for this project. The piers will be installed beneath the spread footing foundations to both improve the existing fill and transfer load to the relatively dense Glaciofluvial Deposits below.

The advantage to using aggregate piers for ground improvement is that conventional spread footings may be used for support of the proposed structure. Footings should be designed for a net allowable bearing capacity of 6,000 pounds per square foot (psf) which assumes footings have a minimum dimension of at least 3 feet. The bearing pressure should be reduced proportionally for foundations less than 3 feet wide. A performance specification will be prepared requiring an improved allowable bearing capacity of 6,000 psf. Settlement will be limited to 1 inch overall and  $\frac{3}{4}$  inch of differential settlement.

Exterior foundations exposed to freezing should bear at a minimum depth of 3.5 feet below adjacent grade for protection against frost action. Footings at interior locations may be placed at shallower depths, however building shutdowns during cold weather should be considered.

### **Deep Foundations – H Piles**

The second alternative for foundation support is 14x89 H-piles, with pile tip reinforcement, driven to end bearing on bedrock. Design 14x89 steel H-piles for an allowable load of 70 kips. It is anticipated that tip elevations will range from Elevation 123.5 feet to Elevation 127.5 feet. Lateral resistance will be determined when pile loading is available later in the design.

Total settlement is anticipated to be up to 1/4 inch and occur during construction as load is applied.

It is recommended that a load test be completed at the site on a pile installed in uniform site soil conditions. The load test may be completed using either ASTM D1143 or ASTM D4945. We recommend a minimum of one static load test (ASTM D1143) or two Pile Driving Analyzer (PDA – ASTM D4945) tests.

## **4.2 Floor Slab Design**

The floor slab may be designed as a slab-on-grade bearing on a minimum 12-inch thick layer of compacted Structural Fill (ConnDOT M.02.06, Grading A) placed following the removal of the existing pavement for both foundation support alternatives. Existing fill may remain in place beneath the floor slab provided that intensive proof compaction of the subgrade is completed prior to placement of the compacted structural fill. Aggregate pier or pile support of the floor slab is not required.

Underslab drainage is not required. Exterior grades should slope away from the building to shed water.



#### 4.3 Seismic Design

Description	Value
Code Used	Connecticut State Building Code
Site Class	D
Maximum considered earthquake ground motions	0.064g (1.0 second spectral response acceleration), S <sub>1</sub> 0.183g (0.2 second spectral response acceleration), S <sub>s</sub>
Liquefaction potential in event of an earthquake	Not susceptible

#### 4.4 Backfill Materials

**Structural Fill** - Structural Fill should be used within the limits of the proposed building. Structural Fill should consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, recycled material, and other deleterious materials, and conform to ConnDOT M.02.06, Grading A. Structural Fill should be compacted in maximum 9-inch-thick, loose lifts to at least 95 percent of the maximum dry density determined in accordance with ASTM D1557.

**Crushed Stone** – Crushed Stone should be used for filling below foundations and around drain pipes, and should consist of hard, durable, crushed or broken stone, free from loam or clay, surface materials. Crushed Stone should meet the requirements of ConnDOT M.01.01, No. 6 (¾-inch minus). Crushed stone should be placed in maximum 12-inch-thick loose lifts and compacted with at least 4 to 6 passes of a double-drum, walk-behind, vibratory compactor.

**Geotextile Fabric** – Geotextile fabric should consist of Mirafi 140N or an approved equal product.

#### 4.5 Reuse of Existing Soils

The existing soils to be excavated will consist of Fill soils. These soils are not expected to be suitable for reuse as Structural Fill. Excavated soils may be suitable for reuse as common fill if they are deemed environmentally appropriate by the project environmental consultant and do not contain a significant amount of construction debris. However, the existing fill soils have a high fines content and will be difficult to properly compact when wet, and may need to be dried to achieve compaction. Drying the soils can be difficult and at times impractical, particularly during periods of cold and wet weather.

### 5.0 CONSTRUCTION CONSIDERATIONS

#### 5.1 Subgrade Preparation

All existing utilities should be removed and relocated outside the limits of the proposed garage prior to the start of construction. Excavations to remove these items should be backfilled in compacted, maximum 9-inch lifts of Structural Fill, or Crushed Stone over geotextile fabric.

The Fill is susceptible to disturbance by construction equipment, especially when wet. Excavation to footing subgrade should be made using a smooth-bladed backhoe bucket. A 12-inch thick layer of crushed stone over geotextile fabric should be placed over the subgrade immediately following footing excavation.

Excavated subgrades for the shallow foundations should be proof compacted with six passes of a large vibratory plate compactor capable of exerting a minimum force of 2,000 lbs. in trench excavations. Soft, yielding or otherwise unacceptable soils should be over-excavated and replaced with either compacted Structural Fill or Crushed Stone wrapped in a geotextile separation fabric. If vibratory proof compaction of the subgrade will be detrimental due to the presence of water at the subgrade, static rolling with a double drum walk behind roller may be allowed at the discretion of the engineer.

## **5.2 Excavation and Dewatering**

Groundwater was encountered approximately 16 feet to 18 feet below the existing ground surface. Dewatering is not anticipated to be required during foundation construction. However, should it become necessary due to stormwater runoff, we anticipate that excavation dewatering may be accomplished by open pumping from sumps located in the bottoms of excavations. Discharge of excavation dewatering fluids should comply with all applicable regulations. The site should be graded to direct runoff away from excavations.

Excavations and excavation support should be designed and constructed in conformance with all OSHA (CFR 1976, latest edition), and State regulations. Conventional heavy construction equipment should be adequate for excavation in these soils.

## **5.3 Aggregate Piers**

Ground improvement consisting of aggregate piers is recommended below spread footings. Aggregate piers should be designed and installed by a specialty contractor based on a performance specification. We will develop a performance specification that requires a design bearing pressure of 6,000 psf, limits maximum total settlement to 1 inch, and limits the maximum differential settlement to  $\frac{3}{4}$  inch, and require a modulus load test. The specification will require that the contractor prepare, install, and remove temporary access roads/pads for support of aggregate pier installation equipment.

## **5.4 Pile Installation**

The maximum hammer energy should be determined by a wave equation analysis by the contractor based on the specific hammer characteristics. Test piles and load testing should be conducted as indicated above. Vibrations from pile driving should not affect the structural integrity of adjacent structures. However, vibration and noise will likely be noticeable inside buildings 200 feet away, or more. The contractor should be required to conduct a preconstruction survey of structures within 200 feet prior to the start of construction. Vibration monitoring should be conducted between the proposed garage and the surrounding structures during pile driving activities.

We recommend a minimum of one static load test (ASTM D1143) or two PDA (ASTM D4945) tests.

## **5.5 Settlement Monitoring For Aggregate Piers**

Settlement monitoring points should be established on spread footing foundations after placement, and subsequently (as footings are backfilled) on columns above foundations at approximately 40-foot intervals, to monitor settlement of

footings and to verify the design meets the performance specification. Settlement monitoring points should be monitored by optical survey on a weekly basis during construction.

## **5.6 Freezing Conditions**

Soils at the site are susceptible to frost action. If construction is performed during freezing weather, special precautions will be required to prevent the subgrade from freezing. Freezing of the soil beneath foundations and slabs during construction may result in settlement when the soil thaws.

All subgrades should be free of frost before placement of concrete. Frost-susceptible soils that have frozen should be removed and replaced with compacted Structural Fill or Crushed Stone over geotextile separation fabric. The footing and the soil adjacent to the footing should be protected from freezing until they are backfilled. Soil placed as fill should be free of frost, as should be the ground on which it is placed. Slabs-on-grade should be heated or insulated during freezing weather to prevent freezing of the subgrade.

## **6.0 FUTURE SERVICES AND LIMITATIONS**

### **6.1 Construction Services**

We recommend that Freeman Companies be engaged during construction to:

- Review contractor submittals related to earthwork, and other geotechnical issues.
- Provide construction monitoring to verify that soil conditions exposed in excavations are in general conformance with our design assumption, and that the geotechnical aspects of construction are consistent with the project specifications.
- Provide consultation to the design team on geotechnical issues.

### **6.2 Limitations**

This report was prepared for the exclusive use of Desman Design Management and the project design team. The recommendations provided herein are based on the project information provided at the time of this report and may require modification if there are any changes in the nature, design, or location of the project.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from the anticipated conditions are encountered, it may be necessary to revise the recommendations in this report.

Our professional services for this project have been performed in accordance with generally accepted engineering practices; no warranty, express or implied, is made.

2018-0110  
 Willard Diloreto Parking Garage  
 CCSU  
 New Britain, Connecticut

Table 1  
 Subsurface Data

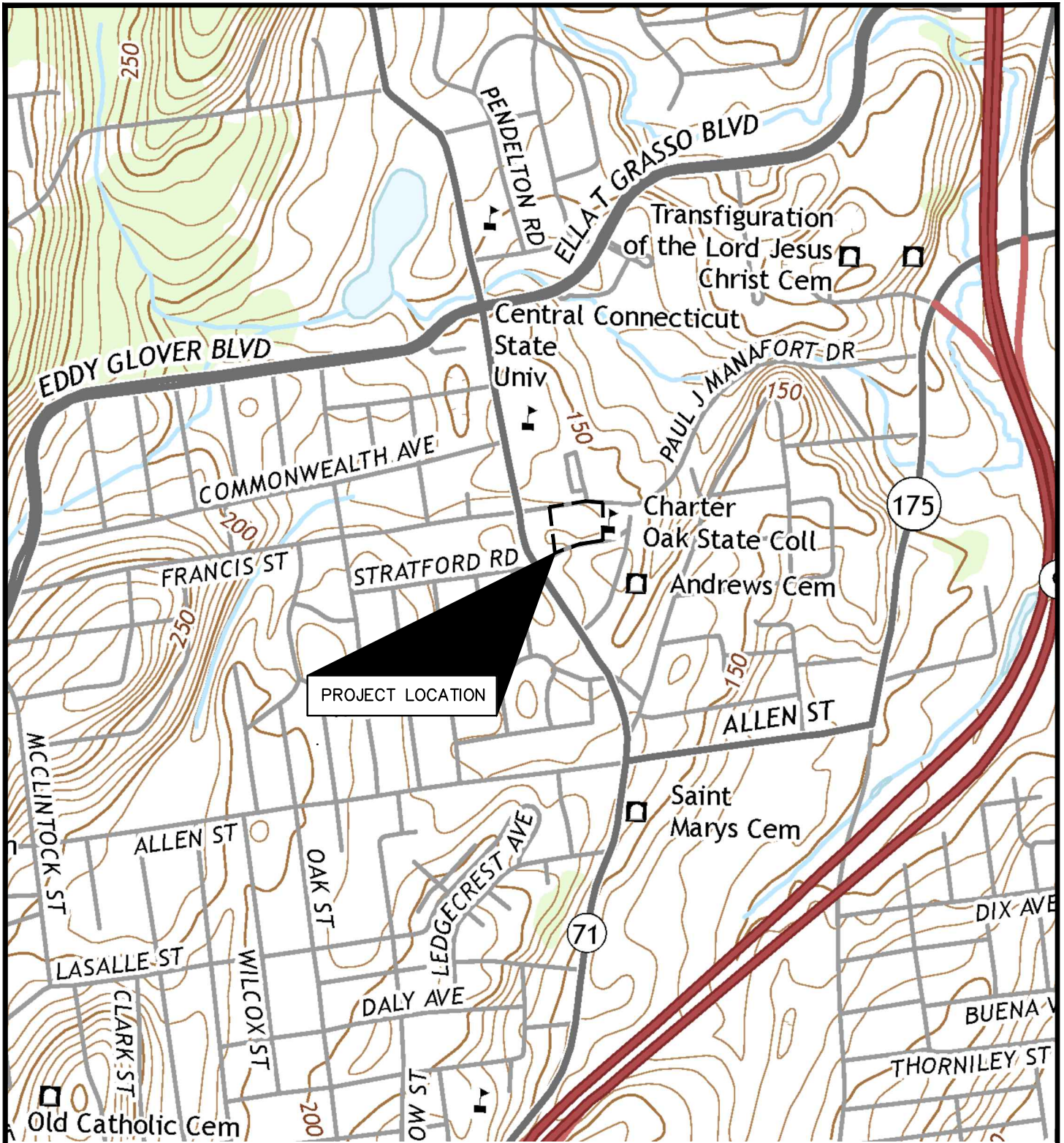
Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)				Groundwater		Bedrock	
			Pavement/Base	Fill	Glaciofluvial Deposit	Glacial Till	Depth (ft.)	Elevation	Depth (ft.)	Elevation
B-1 (OW)	158.5	35	0.2	5.8	20.0	8.5	18	140.5	34.5	124
B-2	159	34	0.3	9.7	15.0	9.0	15.5	143.5	34	125
B-3	159	50 (C)	0.2	5.8	17.0	12.5	15	144	35.5	123.5
B-4	159	40	0.3	12.7	9.0	11.0	16	143	33	126
B-5 (OW)	160	35.1	0.2	10.3	14.5	10.0	16	144	35	125
B-6	160	36	0.2	14.3	8.5	>13	16	144	--	--
B-7	159	34	0.2	3.8	19.0	9.0	15	144	32	127
B-8	159.5	34	0.3	10.2	8.5	13.0	16.5	143	32	127.5
S-1 (OW)	160	45 (C)	0.2	12.8	6.0	15.0	17.5	142.5	34	126
S-2	160	35.5	0.3	8.2	13.5	12	16	144	34	126

Notes:

1. Ground surface elevations are approximate and based upon grading plans provided by Desman Design Management
2. Groundwater levels in borings not designated as monitoring wells were taken during drilling activities and may not represent stabilized conditions.
3. Bedrock elevations include weathered bedrock.
3. ">" - Greater Than "C" - Bedrock Core

## FIGURES

Freeman Companies, LLC - R:\2018\2018-0110\_CCSU Garage\_N Britain\_Diesman\_DWG\Figure\_1.dwg Oct 02, 2018-10:04am Plotted By: tto



**USGS QUADRANGLE MAP**  
**NW BRITAIN, CONNECTICUT**  
**DATE 2015**



**FREEMAN**  
COMPANIES

LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES  
36 JOHN STREET  
HARTFORD, CT 06106  
WWW.FREEMANCOS.COM  
TEL: (860)251-9550  
FAX: (860)986-7161  
ELEVATE YOUR EXPECTATIONS

**SITE LOCATION MAP**  
**CT DAS - CDS # CF-RC-402-ARC:**  
**WILLARD DILORETO PARKING GARAGE**  
**CENTRAL CONNECTICUT STATE UNIVERSITY**  
**NEW BRITAIN, CONNECTICUT**




DRAFTED: T.T.  
CHECKED: A.M.  
APPROVED: N.W.  
SCALED: 1"=1000'  
PROJECT NO.: 2018-0110  
DATE: 08/20/2018

SHEET NO.

**FIGURE 1**

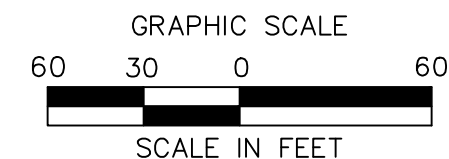


**LEGEND:**

-  S-1 TEST BORINGS
-  OW OBSERVATION WELL
-  PREVIOUSLY DEMOLISHED BUILDING

**NOTES:**

1. BASE PLAN PREPARED BY DESMAN ASSOCIATES
2. EXPLORATION LOCATIONS WERE TAPED FROM EXISTING SITE FEATURES AND ARE APPROXIMATE
3. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION



## SUBSURFACE EXPLORATION LOCATION PLAN

CT DAS - CDS # CF-RC-402-ARC:  
 WILLARD DILORETO PARKING GARAGE  
 CENTRAL CONNECTICUT STATE UNIVERSITY  
 NEW BRITAIN, CONNECTICUT

**FREEMAN**  
 COMPANIES

LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES  
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 TEL: (860)251-9550  
 TOLL FREE: (800)604-5141  
 FAX: (860)986-7161  
 ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		

DRAWN:	T.T.
CHECKED:	A.M.
APPROVED:	A.M.
SCALE:	1"=60'
PROJECT NO.:	2018-0110
DATE:	08/21/2018

SHEET NO.	<b>FIGURE 2</b>
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Geotechnical Report  
Willard Diloreto Parking Garage  
Central Connecticut State University  
New Britain, Connecticut  
January 18, 2019



**APPENDIX A**  
**TEST BORING LOGS**



Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-1 (OW)
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-15-18	Route No.:	Easting:
Finish Date: 8-15-18	Bridge No.:	Surface Elevation: 158.5

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @18.0 on 8/16/18

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt (2")		
	S-1	4	7	10	12	24	6	Brown c-f SAND, some c-f gravel, little silt	
	S-2	11	14	16	15	24	6	Brown c-f SAND, little c-f gravel, little silt	155
5	S-3	10	10	8	7	24	16	Brown c-f SAND, little c-f gravel, little silt	
	S-4	5	6	8	9	24	12	Light brown c-f SAND, trace silt	
								Glaciofluvial	
	S-5	8	9	9	10	24	14	Light brown c-f SAND, trace silt	150
10								Brown f SAND, trace silt, 1" layer of c-sand and f-gravel towards bottom of spoon	
									145
15	S-6	9	10	12	19	24	10	Brown SILT, little sand	
									140
20	S-7	9	11	16	16	24	14	Brown c SAND, little silt	
									135
25									

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1ft	NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 20ft slotted pipe with sand, 20ft to 35ft filter sand	Sheet 1 of 2
No. of Soil Samples: 10	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-1 (OW)
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-15-18	Route No.:	Easting:
Finish Date: 8-15-18	Bridge No.:	Surface Elevation: 158.5

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @18.0 on 8/16/18

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)			
25	S-8	11 11 18 23	24	22		Glaciofluvial (con't)	Brown f SAND, some silt	130
						Glacial Till	Brown c-f SAND, some silt, little c-f gravel	
30	S-9	50/4"	4	3			Red brown c-f GRAVEL, and c-f sand, some silt	125
35	S-10	50/0"	0	0		Weathered Rock	No penetration	120
							END OF BORING 35ft	115
40								110
45								105
50								100

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1ft	NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 20ft slotted pipe with sand, 20ft to 35ft filter sand	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-2
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-16-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15.5 ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt (3")		
	S-1	9	13	10	11	24	6	Brown c-f GRAVEL, some c-f sand, little silt	
	S-2	10	14	15	17	24	6	Brown c-f SAND, some c-f gravel, little silt	155
5	S-3	10	13	14	11	24	12	Brown c-f SAND, some m-f gravel, little silt	
	S-4	11	10	8	8	24	10	Brown c-f SAND, some silt, little m-f gravel	150
10	S-5	6	6	5	9	24	20	Brown f SAND, little silt	
									145
15	S-6	8	9	12	13	24	14	Brown f SAND, trace silt (orange banding)	
									140
20	S-7	9	10	12	14	24	14	Brown f SAND, little silt	
									135

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1.2ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-2
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-16-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15.5 ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
25	S-8	12	14	14	17	24	18		Glacial Till	Brown c-f SAND, some silt, little m-f gravel	130
30	S-10	28	35	50	58	24	14				
35	S-11	50/2"				2	1		Weathered Rock	Recovered fractured bedrock	125
40										END OF BORING 35.2ft	120
45											115
50											110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1.2ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-3
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-14-18	Route No.:	Easting:
Finish Date: 8-15-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt (2")	
	S-1	4	11	13	12	24	8	
	S-2	9	10	15	16	24	8	155
5	S-3	8	5	8	9	24	18	
	S-4	11	10	14	14	24	18	150
10	S-5	8	8	10	11	24	18	
								145
15	S-6	8	10	10	13	24	8	
								140
20	S-7	4	9	12	13	24	18	
								135
25	S-8	8	9	11	14	24	16	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 35.5ft Rock: 14.5ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-3
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-14-18	Route No.:	Easting:
Finish Date: 8-15-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
30	S-9	23 30 50/2"	14	10		Glacial Till (con't)	Change in drilling action	130
35	S-10	50/0"	6	5		Weathered Rock	Red brown c-f SAND and c-f GRAVEL, some silt	125
40	C-1		60	60	17	Bedrock	ARKOSE, thinly bedded, moderately fractured to highly fractured, highly weathered, weak to medium strong, 15° bedding angle, (4-4-3-3-4)	120
45	C-2		60	60	43		ARKOSE, coarse, thinly bedded, moderately fractured, highly weathered, weak to medium strong, 15° bedding angle, Some vertical fractures (4-4-4-3-4)	115
50							END OF BORING 50ft	110
								105

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 35.5ft Rock: 14.5ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10		No. of Core Runs: 2

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-4
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-14-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt (3")		
	S-1	7	2	3	4	24	16	Asphalt Fill	
	S-2	4	5	5	30	24	8	Gray brown c-f SAND, some silt, little m-f gravel	155
5	S-3	8	7	14	15	24	24	Gray brown c-f SAND, little m-f gravel, little silt	
	S-4	16	20	21	21	24	16	Brown f SAND, some silt, trace roots	
								Brown c-f SAND, some silt, little c-f gravel	
								Brown c-f SAND, some c-f gravel, little silt	150
10	S-5	20	9	24	31	24	6	Brown c-f SAND, some c-f gravel, little silt	
								Brown c-f SAND, some silt, little m-f gravel	
								Change in drilling action	145
15	S-6	7	11	13	18	24	16	Glaciofluvial	
								Brown c-f SAND, little silt (orange banding at 16ft)	
								Lots of rig chatter from from 17.5ft to 19ft. Gravel layer	140
20	S-7	16	26	40	38	24	10	Glacial Till	
								Brown f SAND, some silt	135

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 33ft Rock: 7ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-4
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-14-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
25	S-8	32 50/2"	8	6		Glacial Till (con't)	Brown c-f SAND, and c-f gravel, some silt	130
30	S-9	35 36 39 77	24	12		Weathered Rock	Brown c-f GRAVEL, some c-f sand, some silt	125
35	S-10	50/0"	0	0		Bedrock	No penetration, bouncing spoon.	120
40							Slow steady grind from 35ft to 40ft. Bouncing roller bit and rod	115
45							END OF BORING 40ft	110
50								

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 33ft Rock: 7ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02



Driller: M. St. John	<b>CT Department of Construction Services</b>				Hole No.: B-5 (OW)			
Inspector: T. Ta	Town: New Britain			Stat./Offset:				
Engineer: A. McCauliffe	Project No.: 2018-0110			Northing:				
Start Date: 8-13-18	Route No.:			Easting:				
Finish Date: 8-13-18	Bridge No.:			Surface Elevation: 160				
Project Description: Willard Diloreto Parking Garage								
Casing Size/Type: 4-in. Casing		Sampler Type/Size: 1-3/8 inch ID			Core Barrel Type:			
Hammer Wt.: 300lb Fall: 30in.		Hammer Wt.: 140lb Fall: 30in.						
Groundwater Observations: @16.2 on 8/14/18, @16.0 on 8/16/18								
Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt (2")	160
	S-1	11	27	22	28	24	Brown c-f SAND, some silt, little c-f gravel	
	S-2	16	15	15	14	24	Red brown f SAND, some silt, little c-f gravel, little c-f sand	
5								155
	S-3	11	17	16	11	24	Dark brown to gray c-f SAND, some c-f gravel, some silt, little brick, asphalt, and wood	
	S-4	7	8	8	7	24	Dark brown to brown c-f SAND, some c-f gravel, little silt, little brick and coal	
10								150
	S-5	8	17	30	26	24	Gray brown c-f SAND, some silt Brown c-f SAND, some silt, trace f gravel	
15								145
	S-6	12	22	25	33	24	Brown c-f SAND, little silt, (bands of SILT at bottom of spoon sample) Lots of rig chatter from from 17.5ft to 20ft. Gravel layer	
20								140
	S-7	17	21	27	26	24	Large gravel lodged at tip. Gravel wash recovered.	
25								135
<p>Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%</p>								
Total Penetration in Earth: 35.1ft Rock: ft		NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 23ft slotted pipe with sand, 23ft to 35.1ft filter sand					Sheet 1 of 2	
No. of Soil Samples: 10		No. of Core Runs: 0						SM-001-M REV. 1/02

Driller: M. St. John	<b>CT Department of Construction Services</b>	Hole No.: B-5 (OW)
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-13-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.2 on 8/14/18, @16.0 on 8/16/18

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
25	S-8	23 50/4"	10	8		Glacial Till	Brown c-f SAND, some c-f gravel, some silt	135
30	S-9	50/3"	3	3			Brown c-f SAND, some c-f gravel, some silt	130
35	S-10	50/1"	1	1			Weathered bedrock	125
							END OF BORING 35.1ft	
40								120
45								115
50								110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 35.1ft Rock: ft	NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 23ft slotted pipe with sand, 23ft to 35.1ft filter sand	Sheet 2 of 2
No. of Soil Samples: 10	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-6
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-15-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt (2")	160
	S-1	6	11	11	13	24	10	Brown to gray c-f SAND, some silt, little m-f gravel, little wood, root, and leaves (slight organic odor), (perched water at 3ft)
	S-2	16	11	16	6	24	12	Brown c-f SAND, some c-f gravel, little silt
5								155
	S-3	2	2	3	2	24	4	Brown c-f SAND, some silt, little c-f gravel
	S-4	4	1	7	4	24	6	Brown c-f SAND, some silt, little c-f gravel Dark brown ORGANIC layer (4") at bottom of spoon
10								150
	S-5	2	2	3	9	24	12	Brown c-f SAND, some silt, little m-f gravel
	S-6	10	17	18	19	24	16	Gray SILT, trace gravel, trace sand, roots Gray to light brown SILT, little f sand, (plastic string)
15								145
	S-7	6	13	18	28	24	18	Brown to gray SILT, some f sand Brown c-f SAND, little silt, (rust colored bands of extremely decomposed flat rock)
20								140
	S-8	21	20	24	27	24	0	No recovery
								Encountered a 1.5ft boulder from 23ft to 24.5ft
25								135

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 36ft Rock: ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 11 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-6
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-15-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
25	S-9	25	25	30	30	24	6		135
30	S-10	20	36	32	53	24	18		130
35	S-11	67	107			12	8		125
40									120
45									115
50									110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 36ft Rock: ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 11	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-7
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-13-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt (2")	
	S-1	6	4	7	6	24	14	Brown to gray c-f SAND, little c-f gravel, little silt
	S-2	4	5	20	23	24	10	Brown gray c-f SAND, some silt, little c-m gravel, trace coal
5								Glaciofluvial
	S-3	17	59	35	60	24	14	Brown f SAND, some silt, little m-f gravel, trace c-f sand
	S-4	65	45	42	56	24	16	Brown c-f SAND, some c-f gravel, little silt
10								
	S-5	11	12	13	15	24	12	Brown c-f SAND, little silt, banded
15								
	S-6	6	7	9	10	24	10	Brown c-f SAND, little silt
20								Lots of rig chatter from 18ft to 20ft. Gravel layer
	S-7	21	22	25	23	24	0	Large gravel lodged at tip
25								Glacial Till

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 33ft Rock: 1ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-7
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-13-18	Bridge No.:	Surface Elevation: 159

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @15ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
25	S-8	28	34	39	40	24	14		Glacial Till (con't)	Brown f SAND, and silt	130
30	S-9	50	69	88		18	14				
		50/0"				0	0		Weathered Rock	Bouncing spoon, no recovery.  END OF BORING 34ft	125
35	S-10										
40											120
45											115
50											110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 33ft Rock: 1ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-8
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-14-18	Bridge No.:	Surface Elevation: 159.5

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0						Asphalt Fill	Asphalt (4")	
	S-1	4	10	19	20		Brown c-f SAND, some c-f gravel, little silt, concrete	
	S-2	24	35	30	21		Brown c-f SAND, some c-f gravel, little silt	155
5	S-3	16	10	9	7		Brown to gray c-f SAND, some c-f gravel, little silt	
							Brown c-f SAND, little silt	
	S-4	10	9	7	7		Brown c-f SAND, little silt	
10							Brown c-f SAND, little silt	150
	S-5	6	11	15	20		Glaciofluvial Brown f SAND, SILT bands	
15							Brown c-f SAND, little silt (two silt lenses lenses at 16.5ft)	145
	S-6	11	6	7	23			
20							Glacial Till	140
	S-7	13	97	50	30		Red brown c-f SAND, and c-f gravel, some silt Brown c-f GRAVEL, some c-f sand, some silt	
25								135

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 32ft Rock: 2ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: B-8
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-13-18	Route No.:	Easting:
Finish Date: 8-14-18	Bridge No.:	Surface Elevation: 159.5

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
25	S-8	24 100/5"	11	6		Glacial Till (con't)	Red brown c-f GRAVEL, and c-f sand, some silt	
30	S-9	42 61 63 109	24	6			Red brown c-f GRAVEL, and c-f gravel, some silt	130
	S-10	100/4"	4	4		Weathered Rock	Weathered bedrock Casing stopped	125
35							END OF BORING 34ft	
40								120
45								115
50								110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 32ft Rock: 2ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02



Driller: S. Marino	<b>CT Department of Construction Services</b>				Hole No.: S-1 (OW)			
Inspector: T. Ta	Town: New Britain			Stat./Offset:				
Engineer: A. McCauliffe	Project No.: 2018-0110			Northing:				
Start Date: 8-14-18	Route No.:			Easting:				
Finish Date: 8-15-18	Bridge No.:			Surface Elevation: 160				
Project Description: Willard Diloreto Parking Garage								
Casing Size/Type: 4-in. Casing		Sampler Type/Size: 1-3/8 inch ID			Core Barrel Type: NX			
Hammer Wt.: 300lb Fall: 30in.		Hammer Wt.: 140lb Fall: 30in.						
Groundwater Observations: @17.5 on 8/16/18								
Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt (2")	160
	S-1	7	11	8	9	24	8	Brown c-f SAND, little c-f gravel, little silt
	S-2	9	10	12	8	24	12	Brown to dark brown c-f SAND, little c-f gravel, little silt, little brick, asphalt, and wood
5								155
	S-3	1	5	7	8	24	14	Brown to dark brown c-f GRAVEL and SILT, some sand, brick and wood
	S-4	3	5	8	24	24	12	Brown c-f SAND, some silt, little m-f gravel
10								150
	S-5	39	33	41	40	24	10	Red to brown c-f SAND, and c-f gravel, some silt. Gravel resembles weathered rock, 2" diagonal seam of tan sandy silty
							Glaciofluvial	Change in drilling action
15								145
	S-6	12	14	15	15	24	18	Brown f SAND, some silt, lenses of c-f sand
							Glacial Till	
20								140
	S-7	30	23	16	16	24	6	Red brown c-f SAND, and c-f gravel, some silt
25								135
<p>Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%</p>								
Total Penetration in Earth: 34ft Rock: 11ft		NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 25ft slotted pipe with sand, 25ft to 45ft filter sand					Sheet 1 of 2	
No. of Soil Samples: 10		No. of Core Runs: 2						SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: S-1 (OW)
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-14-18	Route No.:	Easting:
Finish Date: 8-15-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @17.5 on 8/16/18

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
25	S-8	24	33	75	100	24	16		Glacial Till (con't)	Red brown c-f GRAVEL, and c-f sand, some silt	135
30	S-9	100/5"				5	4			Red brown c-f GRAVEL, and c-f sand, some silt	130
35									Weathered Rock	Change in drilling action	125
									Bedrock		
40	C-1					60	28	7		ARKOSE, thinly bedded, highly fractured, weak, 15° bedding angle, (4-4-3-3-3)	120
45	C-2					60	58	7		ARKOSE, coarse, thinly bedded, moderately fractured to highly fractured, highly weathered, weak to medium strong, 15° bedding angle, (3-3-4-5-5)	115
50										END OF BORING 45ft	110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 11ft	NOTES: Road box with cement at top, back from 1ft to 3ft, 6" bentonite seal, 3.5ft to 10ft riser with filter sand, 10ft to 25ft slotted pipe with sand, 25ft to 45ft filter sand	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: S-2
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-16-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Topsoil (4") Hand cleared to 3ft	160
	S-3	5	4	3	3	24	18	Brown f SAND, some silt, little m-f gravel
5	S-2	5	6	7	7	24	12	Brown c-f SAND, some silt, little c-f gravel
	S-3	6	10	16	24	24	14	Brown c-f SAND, little m-f gravel, little silt
10	S-4	18	20	23	24	24	18	Brown f SAND, some silt
15	S-5	7	8	12	13	24	12	Brown c-f SAND, little f gravel, little silt
20	S-6	8	10	16	21	24	16	Brown f SAND, some silt, gravel at tip of spoon
25								135

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1.3ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 9 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: S. Marino	<b>CT Department of Construction Services</b>	Hole No.: S-2
Inspector: T. Ta	Town: New Britain	Stat./Offset:
Engineer: A. McCauliffe	Project No.: 2018-0110	Northing:
Start Date: 8-16-18	Route No.:	Easting:
Finish Date: 8-16-18	Bridge No.:	Surface Elevation: 160

Project Description: Willard Diloreto Parking Garage

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16ft ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
25	S-7	47 55 50/3"	15	8		Glacial Till (con't)	4" Extremely decomposed boulder at top of sample recovery Brown c-f SAND, some c-f gravel, some silt	135
30	S-8	54 75	12	10				Red brown c-f GRAVEL, and c-f sand, some silt
35	S-9	100/3"	3	2		Weathered Rock	Weathered bedrock	125
40							END OF BORING 35.3ft	120
45								115
50								110

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test  
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 34ft Rock: 1.3ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 9 No. of Core Runs: 0		SM-001-M REV. 1/02

Geotechnical Report  
Willard Diloreto Parking Garage  
Central Connecticut State University  
New Britain, Connecticut  
January 18, 2019

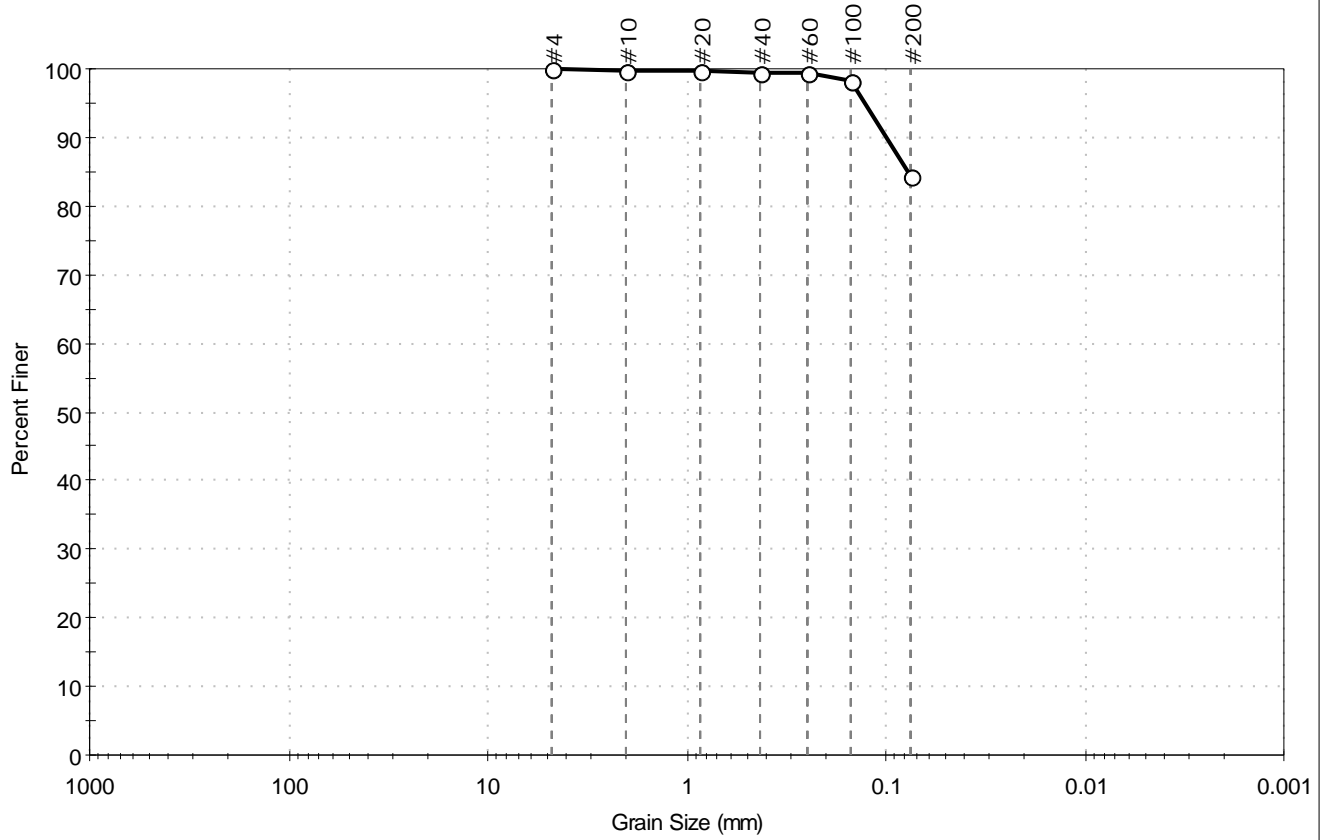


**APPENDIX B**  
**RESULTS OF LABORATORY TESTING**



Client: Freeman Companies, LLC	Project: CCSU Bridge	Location: New Britain	Project No: GTX-308664
Boring ID: B-1	Sample Type: bag	Tested By: jbr	
Sample ID: S-6	Test Date: 08/27/18	Checked By: emm	
Depth: 15-17	Test Id: 469969		
Test Comment: ---			
Visual Description: Moist, reddish brown silt with sand			
Sample Comment: ---			

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	15.6	84.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#200	0.075	84		

<u>Coefficients</u>	
D <sub>85</sub> = 0.0771 mm	D <sub>30</sub> = N/A
D <sub>60</sub> = N/A	D <sub>15</sub> = N/A
D <sub>50</sub> = N/A	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

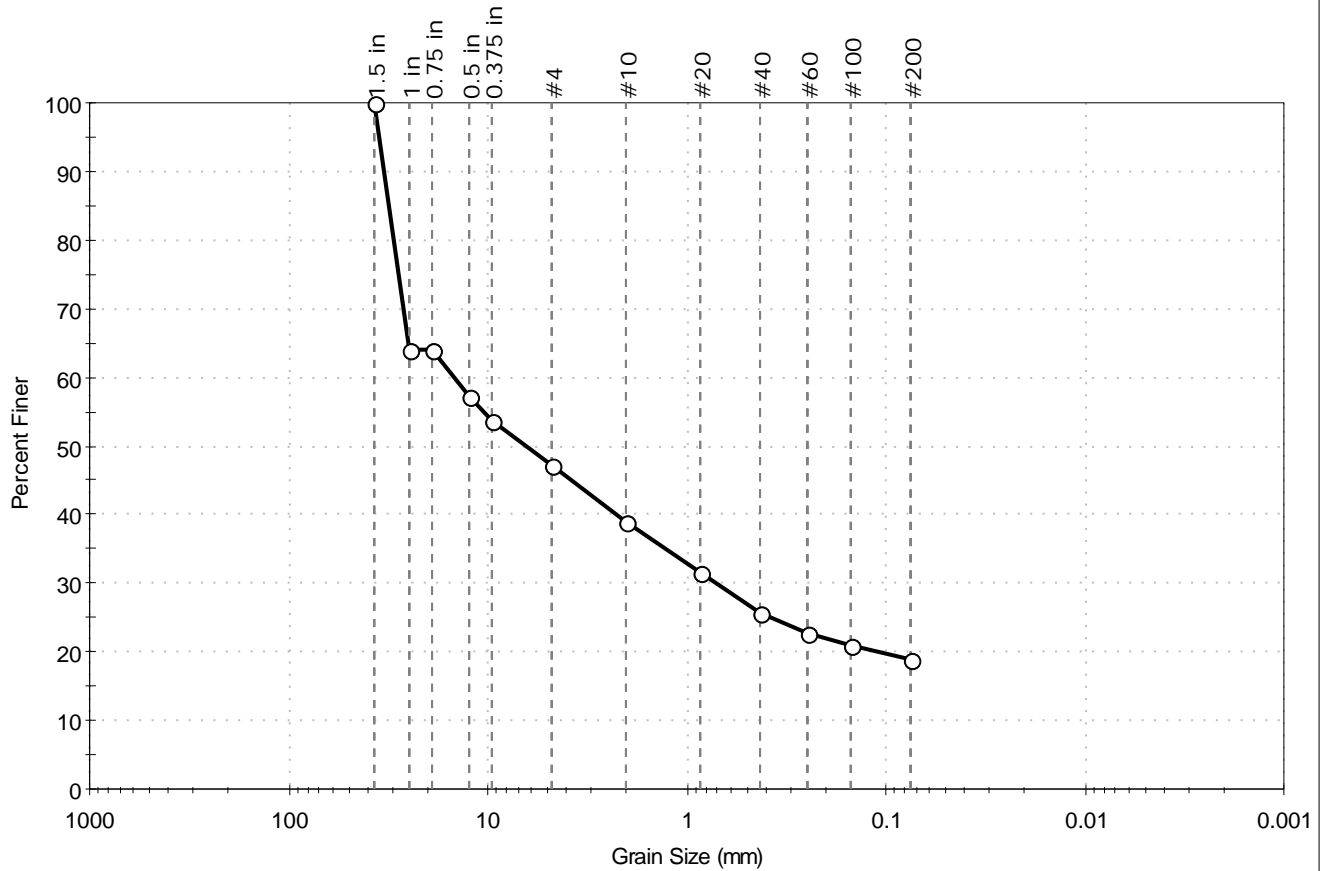
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	CCSU Bridge		
Location:	New Britain	Project No:	GTX-308664
Boring ID:	B-2	Sample Type:	bag
Sample ID:	S-1	Test Date:	08/27/18
Depth :	1-3	Test Id:	469970
Test Comment:	---		
Visual Description:	Moist, red silty gravel with sand		
Sample Comment:	---		

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	52.9	28.3	18.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	64		
0.75 in	19.00	64		
0.5 in	12.50	57		
0.375 in	9.50	54		
#4	4.75	47		
#10	2.00	39		
#20	0.85	32		
#40	0.42	26		
#60	0.25	23		
#100	0.15	21		
#200	0.075	19		

<u>Coefficients</u>	
D <sub>85</sub> = 31.6882 mm	D <sub>30</sub> = 0.7087 mm
D <sub>60</sub> = 14.8404 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 6.4542 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

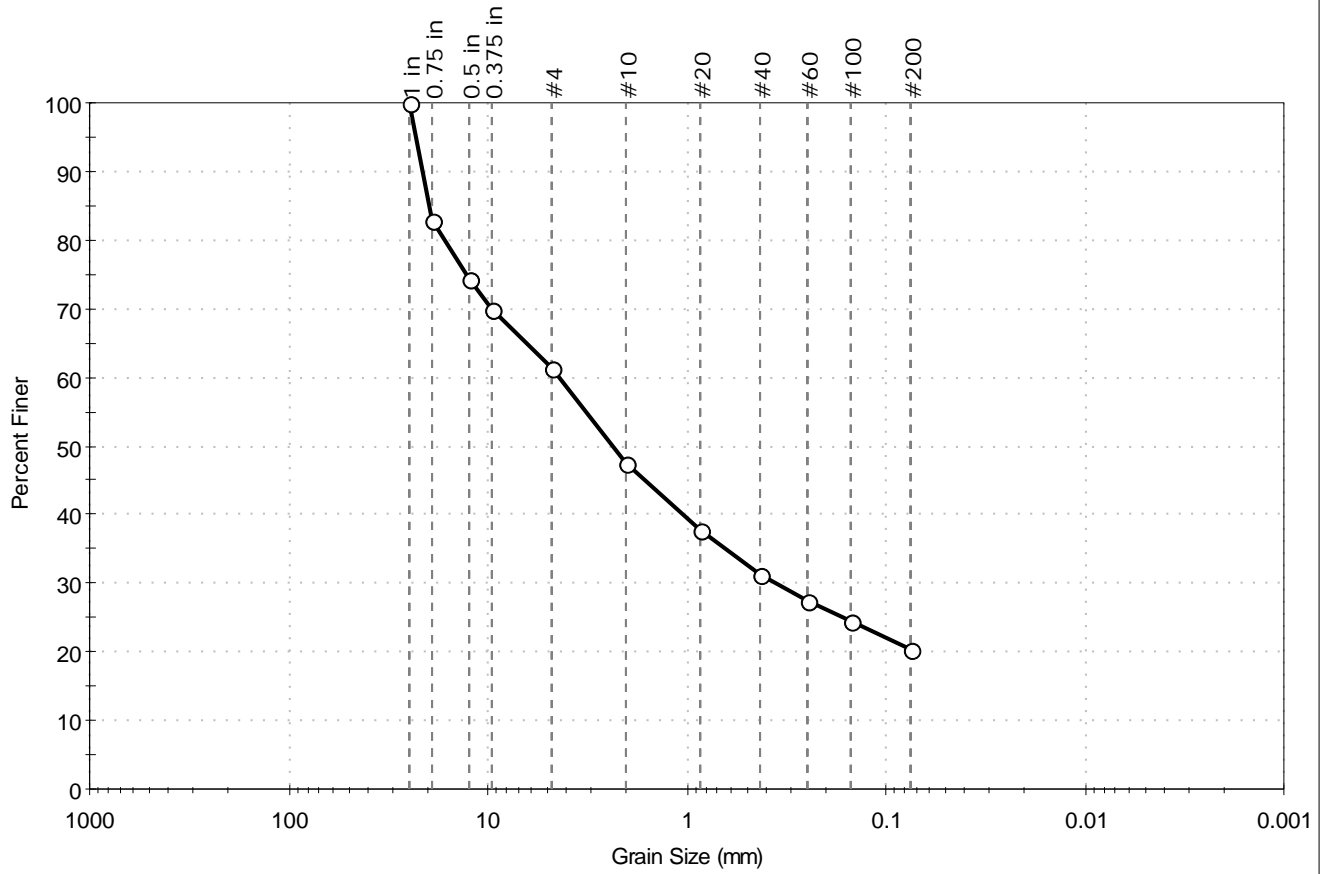
<u>Classification</u>	
ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Freeman Companies, LLC	Project No: GTX-308664
Project: CCSU Bridge	
Location: New Britain	
Boring ID: B-3	Sample Type: bag
Sample ID: S-10	Test Date: 08/27/18
Depth: 35-35.5	Test Id: 469971
Test Comment: ---	Tested By: jbr
Visual Description: Moist, red silty sand with gravel	Checked By: emm
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	38.7	41.1	20.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	83		
0.5 in	12.50	74		
0.375 in	9.50	70		
#4	4.75	61		
#10	2.00	47		
#20	0.85	38		
#40	0.42	31		
#60	0.25	27		
#100	0.15	24		
#200	0.075	20		

<u>Coefficients</u>	
D <sub>85</sub> = 19.6234 mm	D <sub>30</sub> = 0.3533 mm
D <sub>60</sub> = 4.3772 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 2.3561 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

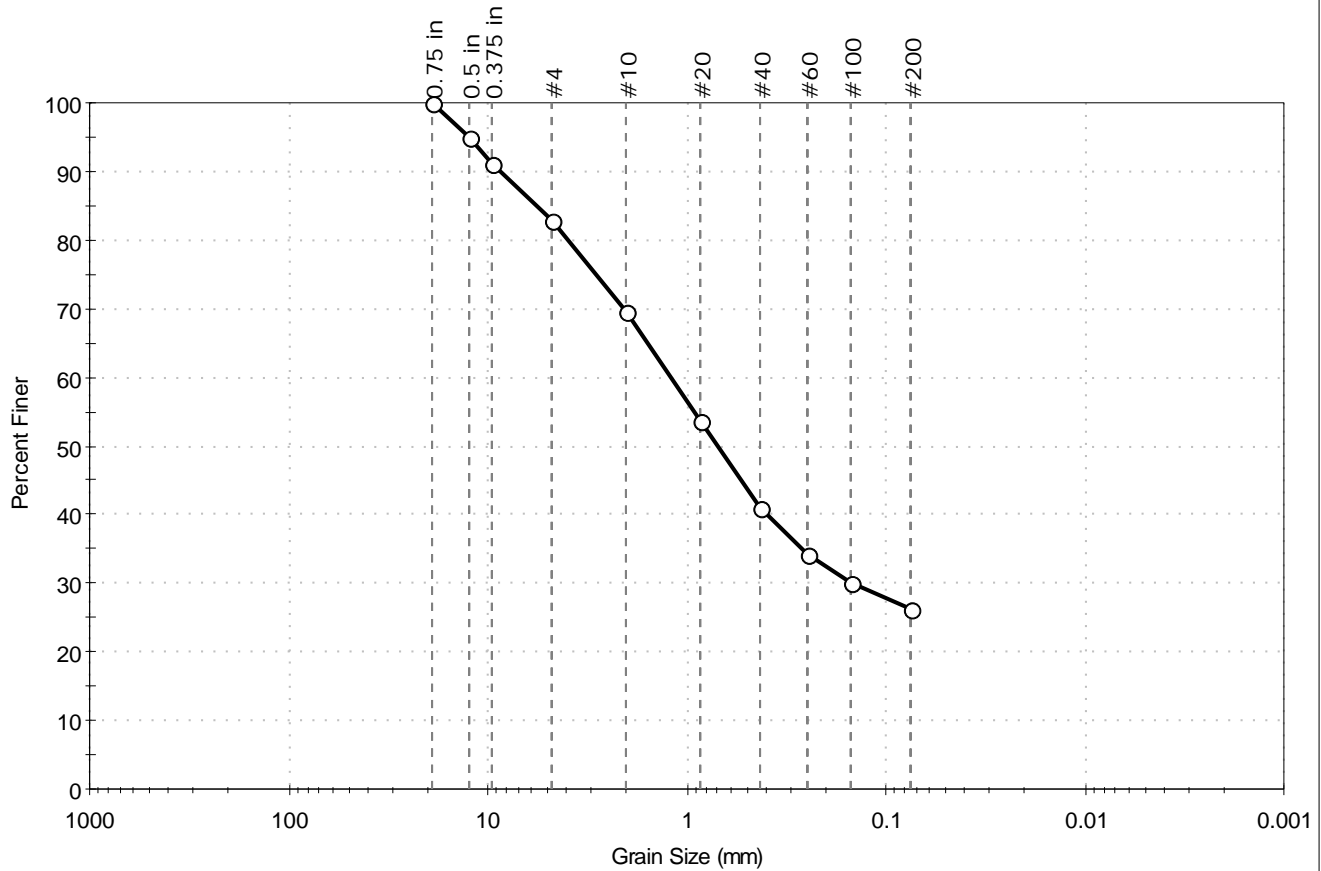
<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD





Client: Freeman Companies, LLC	Project No: GTX-308664
Project: CCSU Bridge	
Location: New Britain	
Boring ID: B-4	Sample Type: bag
Sample ID: S-3	Test Date: 08/27/18
Depth: 5-7	Test Id: 469972
Test Comment: ---	Tested By: jbr
Visual Description: Moist, reddish brown silty sand with gravel	Checked By: emm
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	17.2	56.6	26.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	91		
#4	4.75	83		
#10	2.00	69		
#20	0.85	54		
#40	0.42	41		
#60	0.25	34		
#100	0.15	30		
#200	0.075	26		

<u>Coefficients</u>	
D <sub>85</sub> = 5.6980 mm	D <sub>30</sub> = 0.1490 mm
D <sub>60</sub> = 1.2014 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 0.6988 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

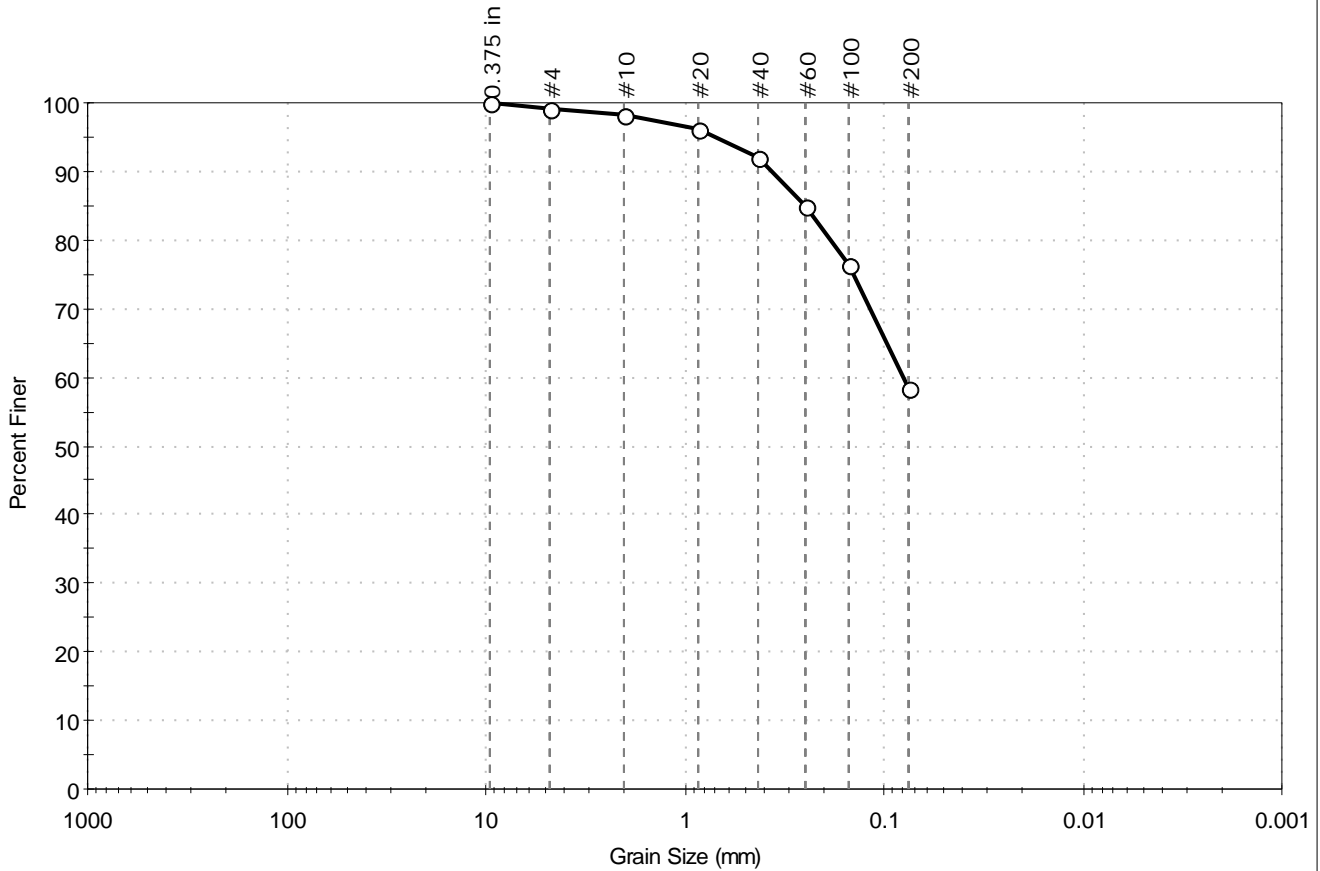
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: Freeman Companies, LLC	Project No: GTX-308664
Project: CCSU Bridge	
Location: New Britain	
Boring ID: B-5	Sample Type: bag
Sample ID: S-5	Test Date: 08/27/18
Depth: 10-12	Test Id: 469973
Test Comment: ---	Tested By: jbr
Visual Description: Moist, brown sandy silt	Checked By: emm
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.8	40.8	58.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	98		
#20	0.85	96		
#40	0.42	92		
#60	0.25	85		
#100	0.15	76		
#200	0.075	58		

<u>Coefficients</u>	
D <sub>85</sub> = 0.2488 mm	D <sub>30</sub> = N/A
D <sub>60</sub> = 0.0798 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = N/A	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

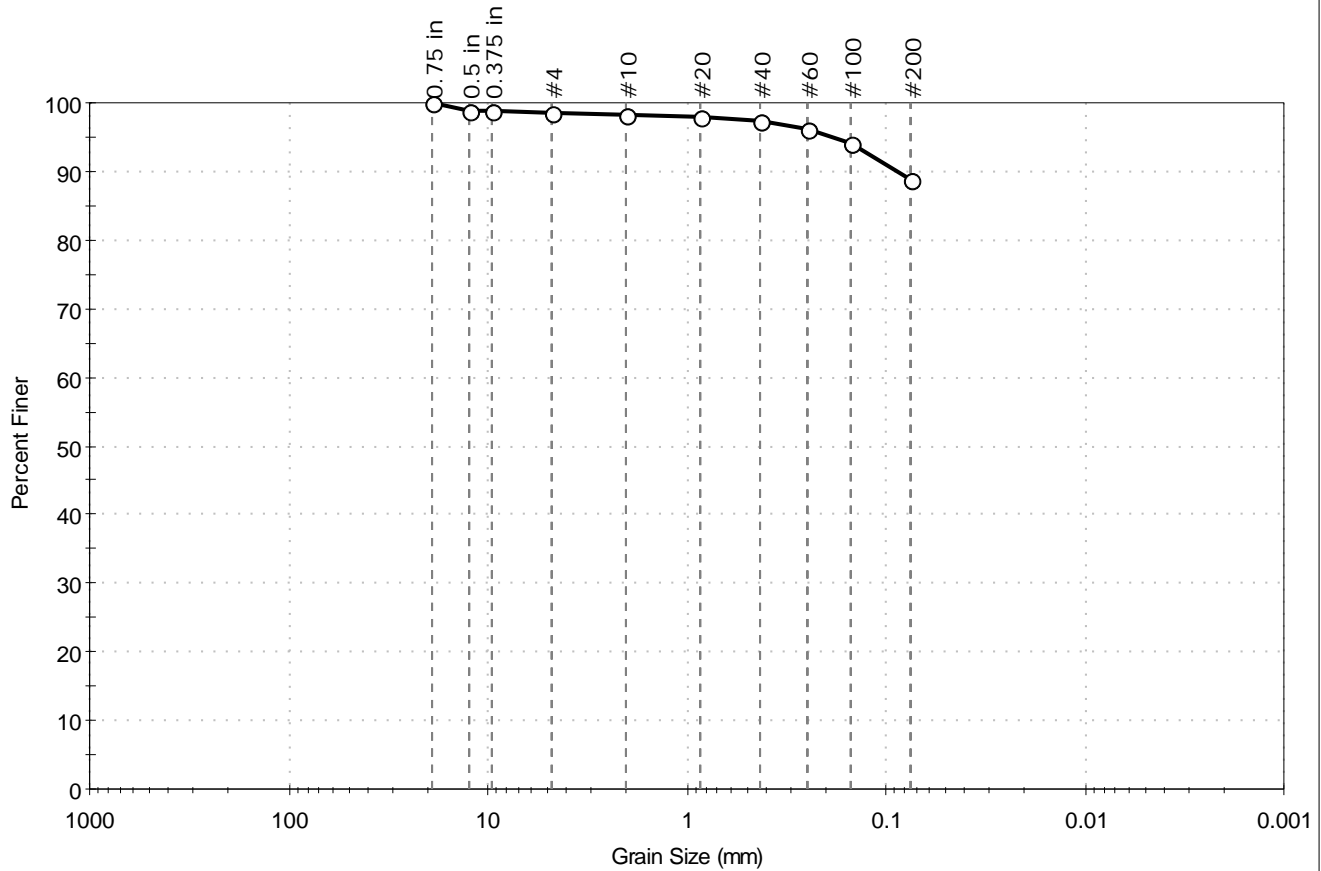
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client: Freeman Companies, LLC	Project No: GTX-308664
Project: CCSU Bridge	
Location: New Britain	
Boring ID: B-6	Sample Type: bag
Sample ID: S-5	Test Date: 08/27/18
Depth: 9-11	Test Id: 469974
Test Comment: ---	Tested By: jbr
Visual Description: Moist, brown silt	Checked By: emm
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	1.5	9.8	88.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	99		
0.375 in	9.50	99		
#4	4.75	98		
#10	2.00	98		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	94		
#200	0.075	89		

<u>Coefficients</u>	
D <sub>85</sub> = N/A	D <sub>30</sub> = N/A
D <sub>60</sub> = N/A	D <sub>15</sub> = N/A
D <sub>50</sub> = N/A	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

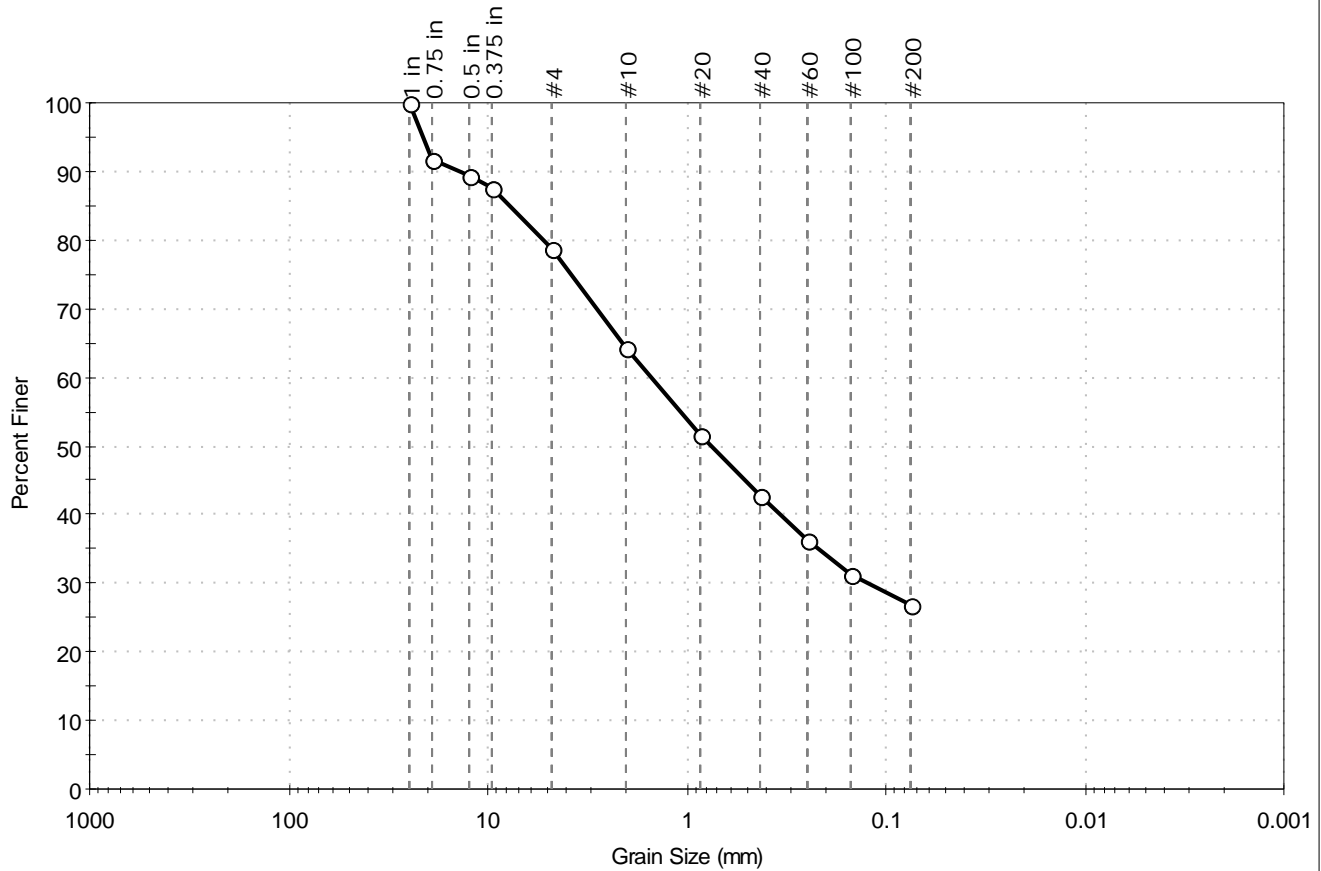
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client: Freeman Companies, LLC	Project No: GTX-308664
Project: CCSU Bridge	
Location: New Britain	
Boring ID: B-7	Sample Type: bag
Sample ID: S-9	Test Date: 08/27/18
Depth: 30-31	Test Id: 469975
Test Comment: ---	Tested By: jbr
Visual Description: Moist, reddish brown silty sand with gravel	Checked By: emm
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	21.3	51.7	27.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	89		
0.375 in	9.50	88		
#4	4.75	79		
#10	2.00	64		
#20	0.85	52		
#40	0.42	43		
#60	0.25	36		
#100	0.15	31		
#200	0.075	27		

<u>Coefficients</u>	
D <sub>85</sub> = 7.7920 mm	D <sub>30</sub> = 0.1233 mm
D <sub>60</sub> = 1.5005 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 0.7504 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

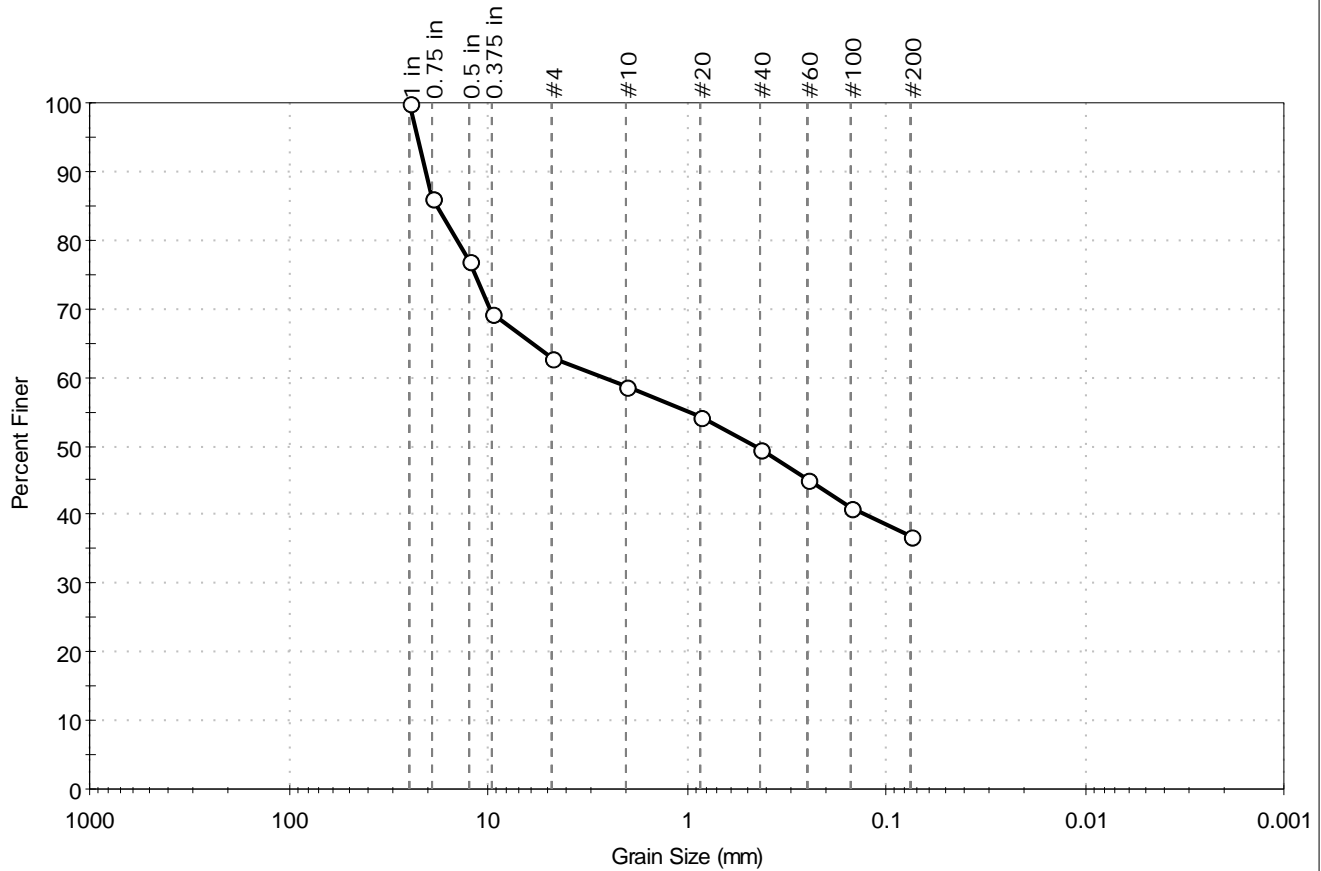
<u>Classification</u>	
ASTM	N/A
<u>AASHTO</u> Silty Gravel and Sand (A-2-4 (0))	

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	CCSU Bridge		
Location:	New Britain	Project No:	GTX-308664
Boring ID:	S-1	Sample Type:	bag
Sample ID:	S-3	Test Date:	08/27/18
Depth:	5-7	Test Id:	469976
Test Comment:	---		
Visual Description:	Moist, dark brown clayey gravel with sand		
Sample Comment:	---		

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	37.0	26.2	36.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	86		
0.5 in	12.50	77		
0.375 in	9.50	69		
#4	4.75	63		
#10	2.00	59		
#20	0.85	54		
#40	0.42	50		
#60	0.25	45		
#100	0.15	41		
#200	0.075	37		

<u>Coefficients</u>	
D <sub>85</sub> = 18.1232 mm	D <sub>30</sub> = N/A
D <sub>60</sub> = 2.6442 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 0.4553 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	CCSU Bridge		
Location:	New Britain	Project No:	GTX-308664
Boring ID:	C-2	Sample Type:	cylinder
Sample ID:	B-3	Test Date:	08/29/18
Depth :	45-50	Test Id:	470375
Test Comment:	---		
Visual Description:	See photograph(s)		
Sample Comment:	---		

**Bulk Density and Compressive Strength  
of Rock Core Specimens by ASTM D7012 Method C**

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
C-2	B-3	45-50 ft	162	4893	1	Yes	---

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.  
 All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.  
 The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.  
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure  
 (See attached photographs)



Client: Freeman Companies, LLC	Test Date: 8/29/2018
Project Name: CCSU Bridge	Tested By: trm
Project Location: New Britain	Checked By: jsc
GTX #: 308664	
Boring ID: C-2	
Sample ID: B-3	
Depth: 45-50 ft	
Visual Description: See photographs	

**UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543**

<b>BULK DENSITY</b>				<b>DEVIATION FROM STRAIGHTNESS (Procedure S1)</b>			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES			
Specimen Length, in:	4.12	4.12	4.12	Maximum difference must be $<$ 0.020 in. <b>Straightness Tolerance Met? YES</b>			
Specimen Diameter, in:	1.97	1.97	1.97				
Specimen Mass, g:	532.78						
Bulk Density, lb/ft <sup>3</sup> :	162						
Length to Diameter Ratio:	2.1						
		<b>Minimum Diameter Tolerance Met?</b>	<b>YES</b>				
		<b>Length to Diameter Ratio Tolerance Met?</b>	<b>YES</b>				

<b>END FLATNESS AND PARALLELISM (Procedure FP1)</b>															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	0.00000	0.00000
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in: 0° = 0.00010      90° = 0.00000														
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in: 0° = 0.0001      90° = 0 Maximum difference must be $<$ 0.0020 in.      Difference = $\pm$ 0.00005 <b>Flatness Tolerance Met? YES</b>														

<p><b>End 1 Diameter 1</b>      <math>y = -0.00003x - 0.00002</math></p>	<p><b>End 1 Diameter 2</b>      <math>y = 0.00000</math></p>	<p><b>DIAMETER 1</b></p> <p>End 1: Slope of Best Fit Line: 0.00003 Angle of Best Fit Line: 0.00196</p> <p>End 2: Slope of Best Fit Line: 0.00003 Angle of Best Fit Line: 0.00180</p> <p>Maximum Angular Difference: 0.00016</p> <p><b>Parallelism Tolerance Met? YES</b> Spherically Seated</p>
<p><b>End 2 Diameter 1</b>      <math>y = 0.00003x - 0.00003</math></p>	<p><b>End 2 Diameter 2</b>      <math>y = 0.00000</math></p>	

<b>PERPENDICULARITY (Procedure P1)</b> (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be $\leq$ 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00010	1.970	0.00005	0.003	YES		
Diameter 2, in (rotated 90°)	0.00000	1.970	0.00000	0.000	YES	<b>Perpendicularity Tolerance Met? YES</b>	
END 2							
Diameter 1, in	0.00010	1.970	0.00005	0.003	YES		
Diameter 2, in (rotated 90°)	0.00000	1.970	0.00000	0.000	YES		

Client:	Freeman Companies, LLC
Project Name:	CCSU Bridge
Project Location:	New Britain
GTX #:	308664
Test Date:	8/29/2018
Tested By:	trm
Checked By:	jsc
Boring ID:	C-2
Sample ID:	B-3
Depth, ft:	45-50



After cutting and grinding



After break



# ANALYSIS PROCESS

Subsurface Exploration Program



Analyze Data



Evaluate Foundation Options



Foundation Recommendation

# Subsurface Exploration Program



# Analyze Data

Table 1  
Subsurface Data

Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)				Groundwater		Bedrock	
			Pavement/Base	Fill	Glaciofluvial Deposit	Glacial Till	Depth (ft.)	Elevation	Depth (ft.)	Elevation
B-1 (OW)	158.5	35	0.2	5.8	20.0	8.5	18	140.5	34.5	124
B-2	159	34	0.3	9.7	15.0	9.0	15.5	143.5	34	125
B-3	159	50	0.2	5.8	17.0	12.5	15	144	35.5	123.5
B-4	159	40	0.3	12.7	9.0	11.0	16	143	33	126
B-5 (OW)	160	35.1	0.2	10.3	14.5	10.0	16	144	35	125
B-6	160	36	0.2	14.3	8.5	>13	16	144	--	--
B-7	159	34	0.2	3.8	19.0	9.0	15	144	32	127
B-8	159.5	34	0.3	10.2	8.5	13.0	16.5	143	32	127.5
S-1 (OW)	160	45 (R)	0.2	12.8	6.0	15.0	17.5	142.5	34	126
S-2	160	35.5	0.3	8.2	13.5	12	16	144	34	126

Notes:

1. Ground surface elevations are approximate and based upon grading plans provided by Desman Design Management
2. Groundwater levels in borings not designated as monitoring wells were taken during drilling activities and may not represent stabilized conditions.
3. ">" - Greater Than

- Fill – Variable thickness and density – Unsuitable Bearing Strata
- Glaciofluvial Deposit – Medium dense to very dense – Suitable Bearing Strata
- Glacial Till – Medium dense to very dense – Suitable Bearing Strata

# Evaluate Foundation Options

- Site Issue – Deep, Variable Density Fill
- Feasible Foundation Alternatives:
  - Conventional Shallow Foundations with Over-Excavation and Replacement
  - Ground Improvement
  - Deep Foundation

# Evaluate Foundation Options

- Feasible Foundation Alternatives:
  - Conventional Shallow Foundations
    - Over-excavation and replacement
    - Significant depth of fill – requires temporary excavation support with bracing
    - Difficult in fall/winter/spring
  - Ground Improvement – Aggregate Piers
    - Allows for use of shallow foundations without over-excavation
    - Improves the fill in place with conventional construction equipment
    - No over-excavation or temporary excavation support
    - Low vibration
  - Deep Foundation – H-pile
    - Rugged – survivability during driving compared to other types
    - Readily available
    - No over-excavation
    - Requires large crane and storage area/laydown

# Aggregate Pier Specification

- **Specification Controls:**

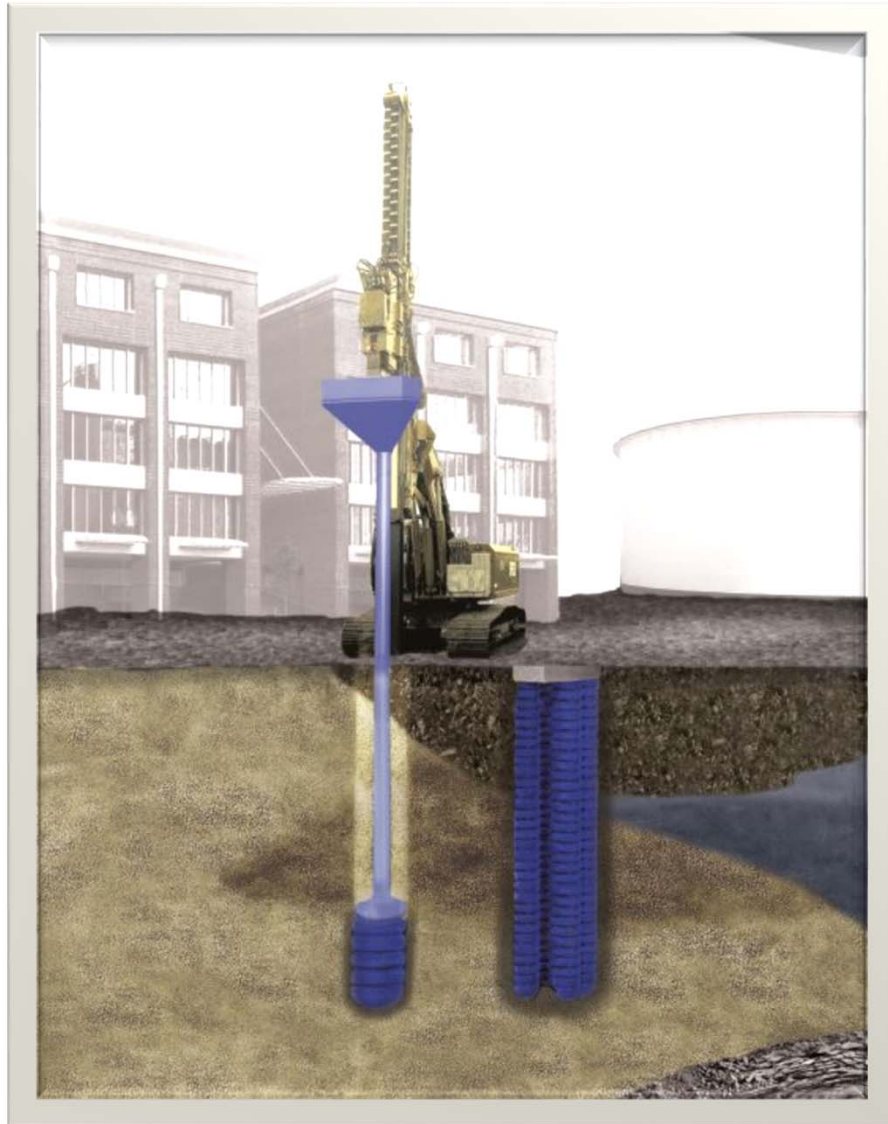
- Named Subcontractor
- Performance Based
  - Provided required allowable bearing capacity that must be met
  - Settlement requirements
- Qualifications
  - Required minimum 10 years of experience in design and installation
  - Design prepared and stamped by CT PE
  - Provide experience requirements for Specialty Contractor
    - Superintendent – 5 years installation exp. of similar size and type projects
  - Provide a list of a minimum of 5 similar projects and contact information
- Design Submittal
  - Provide all calculations and assumptions in stamped design package
  - Includes requirements for settlement monitoring during loading and beyond

# Aggregate Pier Specification Cont.

- **Specification Controls:**

- **Field Control**
  - Add field QA/QC control by Engineer during installation to Statement of Special Inspections
- **Modulus Test**
  - Agg. pier designers provide for a Modulus Test to verify the design.
  - Tested to 150 % of the maximum design top of pier stress
  - Results are presented in a submittal prior to construction production installation commencing
- **Design team retains full control of the submittal process and acceptance or rejection of design**
  - Geotechnical Engineer will provide design submittal review
    - Recommend acceptance/revise and resubmit/rejection based on detailed review of calculations and assumptions

# Aggregate Pier Installation







# **Section 50 50 00 Elevator Agreement**

**ELEVATOR AGREEMENT**

It is hereby agreed on this \_\_\_\_ day of \_\_\_\_, \_\_\_\_ between the State of Connecticut, Department of Administrative Services acting through its Commissioner, \_\_\_\_\_ and \_\_\_\_\_ acting through \_\_\_\_\_ its \_\_\_\_\_ that:

WHEREAS, the State of Connecticut owns several buildings which contain elevators manufactured by \_\_\_\_\_;

WHEREAS, \_\_\_\_\_ Provides a diagnostic device required for the complete service and maintenance of the elevators which diagnostic device has a six (6) month expiration date;

WHEREAS, the State of Connecticut retains several contractors and/or uses its own employees to service the \_\_\_\_\_ elevators;

WHEREAS, the State of Connecticut finds any expiration period an excessive burden on the service and maintenance of the elevators;

NOW, THEREFORE, for good and sufficient consideration of \$1.00 (one dollar) the parties agree as follows:

1. \_\_\_\_\_ shall provide the State of Connecticut with the proper diagnostic devices to service all \_\_\_\_\_, Inc. elevators in all state buildings at no cost to the State of Connecticut.
2. The diagnostic devices shall not contain an expiration date or the use of any proprietary restraint and will be capable of servicing and maintaining the elevators for their life.
3. In the event \_\_\_\_\_ deems it necessary to update the diagnostic devices it shall exchange such devices at no cost to the State of Connecticut. The updated diagnostic devices shall not contain an expiration date and will be capable of servicing and maintaining the elevators for their life. This upgrade will occur prior to previous tools date of expiration.
4. All employees of the State of Connecticut duly qualified or licensed and any contractors retained by the State of Connecticut to service and/or maintain the \_\_\_\_\_ elevators shall use the diagnostic devices solely for the purpose of conducting normal service and maintenance activities.
5. All employees of the State of Connecticut duly qualified or licensed and any contractors retained by the State of Connecticut to service and/or maintain the \_\_\_\_\_ elevators shall not themselves or otherwise give, lend, sell, advertise, transfer or permit access to or the use of the diagnostic devices, in part or whole, in any manner by any means, by any other person.
6. The State of Connecticut understands that the diagnostic devices are capable of programming and/or reprogramming critical equipment, operating performance functions and reprogramming critical equipment functions and parameters including safety and/or test sequences. Improper use may produce unsafe operating conditions.
7. The State of Connecticut agrees that \_\_\_\_\_ is not responsible for the results of the improper use, either directly or indirectly, of the diagnostic devices, unless the device is defective.
8. The State of Connecticut agrees to make all reasonable efforts necessary or appropriate to maintain and protect the diagnostic devices and shall promptly notify \_\_\_\_\_ in writing, of any unauthorized use, possession, loss or theft of the diagnostic devices in part or whole.
9. This Agreement shall be interpreted and enforced pursuant to the laws of the State of Connecticut in the Superior Court for the Judicial District of Hartford, at Hartford, Connecticut.

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Witness

\_\_\_\_\_  
[insert name of Commissioner]  
Commissioner,  
State of Connecticut  
Department of Administrative Services

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Witness

\_\_\_\_\_  
[insert name of signer and title]  
[insert name of Elevator Manufacturer]  
[insert address of Elevator Manufacturer]

End of Section 50 50 00 Elevator Agreement

# **Section 50 60 00 FM Global Checklist for Roofing Systems**



# CHECKLIST FOR ROOFING SYSTEM

## CONTACT INFORMATION:

## INDEX NUMBER:

ROOFING CONTRACTOR (NAME & ADDRESS)	TELEPHONE NO.:	FAX:
	E-MAIL ADDRESS:	CONTACT:
CLIENT (NAME & ADDRESS)	TELEPHONE NO.:	FAX:
	E-MAIL ADDRESS:	CONTACT:

## OVERVIEW OF WORK: *(Submit 1 form per roof area)*

Building Name & Number:			
Building Dimensions: Length:	ft/m;	Width:	ft/m.;
		Height	ft/m.
Roof Slope:			
Parapet Height ,max (in./m):		Parapet Height ,min (in /m):	
Type of Work: <input type="checkbox"/> New Construction <input type="checkbox"/> Recover (New roof over existing Roofing System) <input type="checkbox"/> Reroof (New cover/remove existing roofing system to deck) <input type="checkbox"/> Other			
<b>FM Approved RoofNav Assembly Numbers:</b>			

## ROOF SURFACING:

<input type="checkbox"/> None			
<input type="checkbox"/> Coating		<i>(Trade Name/Application Rate)</i>	
<input type="checkbox"/> Granules		<i>(Application Rate)</i>	
<input type="checkbox"/> Gravel/Slag		<i>(Application Rate)</i>	
<input type="checkbox"/> Ballast:	<input type="checkbox"/> Stone Size	<input type="checkbox"/> Pavers	<i>(Beveled or square edge);</i> <input type="checkbox"/> Other:
Ballast Weight (psf):	Field:	Perimeter:	Corners:

## ROOF COVER/MEMBRANE:

*(Please provide ALL applicable details including trade name, type, number of plies, thickness, reinforced, adhesive)*

<input type="checkbox"/> Panel: <input type="checkbox"/> Through Fastened Metal <input type="checkbox"/> Standing Seam metal <input type="checkbox"/> Fiber Reinforced Plastic (FRP) <input type="checkbox"/> Other:			
<input type="checkbox"/> Single Ply:	<input type="checkbox"/> Adhered	<input type="checkbox"/> Fastened	<input type="checkbox"/> Ballasted
<input type="checkbox"/> Built Up Roofing (BUR)			
<input type="checkbox"/> Modified Bitumen	<input type="checkbox"/> Lap Width	in/mm	<input type="checkbox"/> Lap Adhesion Type
<input type="checkbox"/> Spray Applied			
<input type="checkbox"/> Other:			

## BASE SHEET:

*(Please include Trade Name, Type, and Width)*

<input type="checkbox"/> None	
Trade Name:	Width: <input type="checkbox"/> 36 In. <input type="checkbox"/> 1 meter (39 In.)
<input type="checkbox"/> Fastened	<input type="checkbox"/> Adhered
<input type="checkbox"/> Secured per RoofNav	<b>OR</b> <input type="checkbox"/> Per FM Global Loss Prevention Data Sheet 1-29
Comments:	
<input type="checkbox"/> Lap Width	in/mm <input type="checkbox"/> Lap Adhesion Type
<input type="checkbox"/> Air Retarder	<input type="checkbox"/> Vapor Retarder

## INSULATION

Layer	Trade Name	Thickness (In.)	Fastened	Adhered	Tapered
1. Top			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Next			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Next			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Next			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Glass Fiber/Mineral Wool/Batt		<input type="checkbox"/> Facer Type/Vapor Barrier			
<input type="checkbox"/> Thermal Barrier					

# CHECKLIST FOR ROOFING SYSTEM



<input type="checkbox"/> Other:
<input type="checkbox"/> None

**DECK:**

*(Please include manufacturer, type, yield strength, thickness/gage, etc.)*

<input type="checkbox"/> Steel:	
<input type="checkbox"/> LWIC (Form Deck):	<input type="checkbox"/> Cementitious Wood Fiber:
<input type="checkbox"/> Concrete: <input type="checkbox"/> Pre-cast panels or <input type="checkbox"/> Cast in Place	
<input type="checkbox"/> Wood	
<input type="checkbox"/> Fiber Reinforced Cement	<input type="checkbox"/> Fiber Reinforced Plastic
<input type="checkbox"/> Gypsum: <input type="checkbox"/> Plank	<input type="checkbox"/> Poured
<input type="checkbox"/> Other:	
Comments:	

**ROOF STRUCTURE (Include Size, Gage, Etc.):**

<input type="checkbox"/> Purlins <input type="checkbox"/> "C" OR <input type="checkbox"/> "Z"		
<input type="checkbox"/> Joists <input type="checkbox"/> Wood OR <input type="checkbox"/> Steel		
<input type="checkbox"/> Beams <input type="checkbox"/> Wood OR <input type="checkbox"/> Steel		
<input type="checkbox"/> Other:		
Spacing: Field:	Perimeter:	Corners:
Comments:		

**FASTENERS USED IN ROOF ASSEMBLY:**

<b>Roof Cover Fasteners:</b> Trade Name:		Length:	Diameter:
Stress Plate/Batten:			
Spacing: Field: <b>X</b>	Perimeter: <b>X</b>	Corners: <b>X</b>	
<b>Insulation Fasteners:</b> Trade Name:		Type:	
Size:		Stress Plate:	
Spacing: Field:	Perimeter:	Corners:	
<b>Deck Or Roof Panels Fasteners:</b>		Type:	
Trade Name:		Size Washer:	
Length:	Weld:	Washer:	
If Weld: Size:	Perimeter: <b>X</b>	Corners: <b>X</b>	
Deck Side Lap Fasteners: Field: <b>X</b>	Perimeter: <b>X</b>	Corners: <b>X</b>	
Spacing: Field: <b>X</b>	Perimeter: <b>X</b>	Corners: <b>X</b>	
<b>Base Sheet Fasteners</b>		Type:	
Trade Name:		Length:	
Head Diameter:		Perimeter:	
Spacing: (Attached Sketches as necessary)		Corners:	
Spacing Along Laps: Field:		Perimeter:	
No. Intermediate Rows: Field:		Corners:	
Spacing Along Intermediate Rows: Field:		Perimeter:	
		Corners:	

**PERIMETER FLASHING:**

*(Attach a detailed sketch of metal fascia, gravel stop, nailer, coping, etc.)*

<input type="checkbox"/> FM Approved Flashing	Manufacturer/Trade Name:
<input type="checkbox"/> Other:	Flashing Max Wind Rating:
Nailer Size / Securement Per FM Global Data Sheet 1-49? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Comments:	

**DRAINAGE:**

For new construction: Has roof drainage been designed by a Qualified Engineer per FM Global Loss Prevention Data Sheet 1-54 and the local building code? <input type="checkbox"/> Yes <input type="checkbox"/> No (Attach details)
For re-roofing and recovering: will the roof drainage be changed from the original design (for example: drain inserts, drains covered or removed, new expansion joints, blocked or reduced scupper size)? <input type="checkbox"/> Yes <input type="checkbox"/> No
If yes, were the changes reviewed by a Qualified Engineer? <input type="checkbox"/> Yes <input type="checkbox"/> No (Attach details)
Is secondary (emergency) roof drainage provided per FM Global Data Sheet 1-54? <input type="checkbox"/> Yes <input type="checkbox"/> No (Attach details)

# CHECKLIST FOR ROOFING SYSTEM



## FM Global OFFICE REVIEW

(Please leave blank for FM Global Office Review)

### WIND:

Design Wind Speed: (mph)	Ground Terrain: <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Uplift Pressure in field: (psf)	Uplift Rating Required:
Adequate Uplift Rating Provided:	Adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No

### FIRE:

Internal Assembly Rating: <input type="checkbox"/> Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Non-Combustible	
External Fire Rating: <input type="checkbox"/> Class A <input type="checkbox"/> Class B <input type="checkbox"/> Class C <input type="checkbox"/> None	
Concealed Spaces? <input type="checkbox"/> Yes <input type="checkbox"/> No	Sprinklers below Roof? <input type="checkbox"/> Yes <input type="checkbox"/> No
Adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No	

### HAIL:

Hail Zone <input type="checkbox"/> VSH <input type="checkbox"/> SH <input type="checkbox"/> MH	Hail Rating Provided <input type="checkbox"/> VSH <input type="checkbox"/> SH <input type="checkbox"/> MH
	FM 4473 Specification Class (if provided): <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
Adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No	

### COLLAPSE:

If standing seam, has collapse been reviewed? <input type="checkbox"/> Yes <input type="checkbox"/> No
--

### COMMENTS:

# **Section 50 70 00**

## **Statement of Special Inspections**



# APPENDIX A

## SPECIAL PROVISIONS

### TRAFFIC SIGNAL DESIGN

#### PAUL MANAFORT SR DRIVE AT DILORETO DRIVE New Britain, CT

MMI #6003-05-03

August 27, 2019

*Prepared by:*

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**SPECIAL PROVISIONS**

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## **INDEX TO SPECIAL PROVISIONS**

INTRODUCTION TO THE SPECIAL PROVISIONS

NOTICE TO CONTRACTOR – PROTECTION AND COORDINATION OF EXISTING UTILITIES

NOTICE TO CONTRACTOR – VERIFICATION OF PLAN DIMENSIONS  
AND FIELD MEASUREMENTS

NOTICE TO CONTRACTOR – DUST CONTROL

NOTICE TO CONTRACTOR – RECENT REVISIONS

NOTICE TO CONTRACTOR – TRAFFIC SIGNALS

NOTICE TO CONTRACTOR – AS-BUILT PLANS

NOTICE TO CONTRACTOR – WATER USAGE FEE

NOTICE TO CONTRACTOR – OVERTIME BY CITY EMPLOYEES

SECTION 1.05 – CONTROL OF THE WORK

SECTION 1.06 – CONTROL OF MATERIALS

SECTION 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES

SECTION 1.08 – PROSECUTION AND PROGRESS

SECTION 10.00 – GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC  
SIGNAL PROJECTS

ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

ITEM #1001001A – TRENCHING AND BACKFILLING

ITEM #1102002A – 8' ALUMINUM PEDESTAL

ITEM #1002202A – TRAFFIC CONTROL FOUNDATION – MAST ARM

ITEM #1104023A – 20' STEEL MAST ARM ASSEMBLY

ITEM #1104026A – 25' STEEL MAST ARM ASSEMBLY

ITEM #1104028A – 30' STEEL MAST ARM ASSEMBLY

ITEM #1105101A – 1 WAY, 1 SECTION MAST ARM TRAFFIC SIGNAL

ITEM #1105201A – 1 WAY, 1 SECTION POLE MOUNTED TRAFFIC SIGNAL

ITEM #1106001A – 1 WAY PEDESTRIAN SIGNAL POLE MOUNTED

ITEM #1106002A – 2 WAY PEDESTRIAN SIGNAL POLE MOUNTED

ITEM #1106004A – 2 WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED

ITEM #1107011A – ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR

ITEM #1108118A – NEMA TS2, TYPE 2 TRAFFIC CONTROLLER AND CABINET

ITEM #1108726A – CONFIRMATION LIGHT (TOWN SIGNALS ONLY)

ITEM #1108727A – PHASE SELECTOR (AUDIO)

ITEM #1111201A – TEMPORARY DETECTION (SITE NO. 1)

ITEM #1111600A – EXTENSION BRACKET

ITEM #1112207A – SIREN DETECTOR

ITEM #1112284A – VEHICLE DETECTION MONITOR

ITEM #1112286A – 360 DEGREE CAMERA ASSEMBLY

ITEM #1112289A – 360 DEGREE VIDEO DETECTION PROCESSOR

ITEM #1113725A – 23 AWG 4 TWISTED PAIR CATEGORY 6 CABLE

ITEM #1118012A – REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT

ITEM #1118051A – TEMPORARY SIGNALIZATION

ITEM #1206023A – REMOVAL AND RELOCATION OF EXISTING SIGNS

ITEM #1208931A – SIGN FACE – SHEET ALUMINUM (TYPE IX RETROREFLECTIVE  
SHEETING)

ITEM #1208932A – SIGN FACE – SHEET ALUMINUM (TYPE IV RETROREFLECTIVE  
SHEETING)

## **INTRODUCTION TO THE SPECIAL PROVISIONS**

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, Form 817 and supplements thereto dated January 2019 (otherwise referred to collectively as “Standard Specifications”) is hereby made part of this contract. The Standard Specifications as defined below shall apply to the various items of work which constitute the construction contemplated under this Contract except as amended, supplemented or replaced by the Special Provisions of this Contract and as described herein.

Within the Standard Specifications and Special Provisions of this Contract, the following definitions shall apply:

1. Standard Specifications: Shall mean the State of Connecticut Department of Transportation, Bureau of Highways, "Standard Specifications for Roads, Bridges and Incidental Construction, Form 817 and supplements thereto dated January 2019.

CTDOT, District, State, Department, Commissioner

Connecticut Department of Transportation or its Engineer, Construction Manager, Inspector or other authorized representative or agent of the Owner.

City

City of New Britain or its Engineer, Construction Manager, Inspector or other authorized representative or agent of the Owner.

Inspector/Engineer

Engineer, Construction Manager, Inspector or other authorized representative or agent of the Owner.

Laboratory

Contractor responsible for conducting and paying for all testing required. Laboratory shall be CTDOT approved.

2. Applicable Safety Code: Shall mean the latest edition including any and all amendments, revisions, and additions thereto of the Federal Department of Labor, Occupational Safety and Health Administration's "Occupational Safety and Health Standards" and "Safety and Health Regulations for Construction", the State of Connecticut Labor Department, "Construction Safety Code", or State of Connecticut "Building Code", whichever is the more stringent for the applicable requirement.
3. Items: Reference within the text of these Specifications to Items without a number but a title only, are Special Provision Items within this Contract. Sections or Articles referred to with a number refer to the Standard Specifications defined above.

4. Local Regulatory Agency(ies): is defined as the governing body or authority having jurisdiction over or responsibility for a particular activity within the Scope of this Contract. They may be as specifically defined within the Special Conditions or Special Provisions, otherwise, the Contractor shall be responsible to determine same in the local area of the Contract and should be cognizant of the limit of jurisdiction within the project area.
5. These Specifications, where used in the text of the Special Provision Items, shall mean the Special Provisions of this Contract.

02 - 6003-05-03-au2619-specs - index to special provisions.docx

## **NOTICE TO CONTRACTOR – PROTECTION AND COORDINATION OF EXISTING UTILITIES**

Existing utilities shall be maintained during construction except as specifically stated herein and/or noted on the plans and as coordinated with the utilities. The Contractor shall verify the location of underground, structure mounted and overhead utilities. Construction work within the vicinity of utilities shall be performed in accordance with current safety regulations.

The Contractor shall notify "Call Before You Dig", telephone: 8-1-1 or 1-800-922-4455 for the location of public utility, in accordance with Section 16-345 of the Regulations of the Department of Utility Control.

Representatives of the various utility companies shall be provided access to the work, by the Contractor.

Contractors are cautioned that it is their responsibility to verify locations, conditions, and field dimensions of all existing features, as actual conditions may differ from the information shown on the plans or contained elsewhere in the specifications.

The Contractor shall notify the Engineer prior to the start of work and shall be responsible for all coordination with the Department. The Contractor shall allow the Engineer complete access to the work.

The Contractor shall be liable for all damages or claims received or sustained by any persons, corporations or property in consequence of damage to the existing utilities, their appurtenances, or other facilities caused directly or indirectly by the operations of the Contractor.

Any damage to any existing private and public utility, as a result of the Contractors operations, shall be repaired to the utility's and Engineer's satisfaction at no cost to the State or the Utilities, including all materials, labor, etc., required to complete the repairs.

The Contractor's attention is directed to the requirements of Section 1.07.13 – "Contractor's Responsibilities for Adjacent Property and Services".

Prior to opening an excavation, effort shall be made to determine whether underground installations, i.e., water, sanitary, gas, electric ducts, communication ducts, etc., will be encountered and, if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined by careful probing or hand digging, and when it is uncovered, proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation, as noted above.

The Contractor shall coordinate all utility relocations with the respective utility company.

The Contractor shall coordinate with the appropriate utility company for the adjustment of the utility gate boxes and valves. The Contractor shall notify the utility company a minimum of two weeks in advance of the required gate box and valve adjustments as shown on the plans. All work required to set gate boxes to finished grade shall be completed by the respective utility company.

03 - 6003-05-03-au2619-specs - -ntc\_protection and coordination of existing utilities.docx

## **NOTICE TO CONTRACTOR – VERIFICATION OF PLAN DIMENSIONS AND FIELD MEASUREMENTS**

The Contractor is responsible for verifying all dimensions before any work is begun. Dimensions of the existing structures shown on the plans are for general reference only; they are not guaranteed. The Contractor shall take all field measurements necessary to assure proper fit of the finished work and shall assume full responsibility for their accuracy. When shop drawings and/or working drawings based on field measurements are submitted for approval and/or review, the field measurements shall also be submitted for reference by the reviewer.

In the field, the Contractor shall examine and verify all existing and given conditions and dimensions with those shown on the plans. If field conditions and dimensions differ from those shown on the plans, the Contractor shall use the field conditions and dimensions and make the appropriate changes to those shown on the plans as approved by the Engineer. All field conditions and dimensions shall be so noted on the drawings submitted for approval.

There shall be no claim made against the Town by the Contractor for work pertaining to modifications required by any difference between actual field conditions and those shown by the details and dimensions on the contract plans. The Contractor will be paid at the unit price bid for the actual quantities of materials used or for the work performed, as indicated by the various items in the contract.

04 - 6003-05-03-au2619-specs - ntc\_ verification of plan dimensions.docx



## **NOTICE TO CONTRACTOR – DUST CONTROL**

The Contractor is responsible for controlling air pollution at all times during work of this contract, 24 hours a day, 7 days per week, including non-working hours, weekends and holidays.

The Contractor shall comply with all State and Federal regulations pertaining to dust control. Particular attention shall be made to the Regulations of Connecticut State Agencies Section 22a-174-18a, b “Control of Particulate Emissions”.

The contractor shall submit a dust control plan to the Engineer within 30 days after the Award of the Contract. The dust control plan shall include contact information for the responsible individual(s) from the contractor (24-hour availability) who have authority to implement necessary controls. The plan should detail dust control procedures for anticipated activities that may typically generate dust (ex. Jack hammering, saw-cutting pavement, haul roads, material storage sites, etc.)

The cost for the dust control submittal associated with this “Dust Control” notice shall be included in the general cost of the contract. Payment for the application of dust control items included in the Contract will be under those respective items.

05 - 6003-05-03-au2619-specs - ntc\_dust control.doc

## **NOTICE TO CONTRACTOR – RECENT REVISIONS**

The Contractor is hereby notified that the following Traffic Engineering Special Provisions have been revised:

### Section 10.00 – General Clauses for Highway Illumination and Traffic Signal Projects

- Updated as-built plan requirements

### 1105xxxA – X\_Way\_X\_Section Traffic Signal:

- Changed the color of housing, brackets, and hardware
- Clarified color of housing door and visor.
- Backplates:
  - changed to louvered
  - changed retroreflective strip sheeting type
  - changed aluminum alloy to 5052-H32
  - provided range for acceptable thickness

### 1106xxxA – X\_Way\_Pedestrian Signal:

- Changed the color of housing, brackets, and hardware
- Clarified color of housing door and visor

### 1107007A – Pedestrian Pushbutton and Sign (Piezo)

- Changed the color of housing, brackets, and hardware

### 1107011A – Accessible Pedestrian Signal and Detector (Type A)

- Changed the color of housing, brackets, and hardware
- Changed the sign size to 9” x 15”
- Changed to include confirmation light

### 1112286A – 360 Degree Camera Assembly

- Added installation best practices guide

The Contractor is hereby notified that Traffic Engineering’s following Standard Sheets have been revised:

### TR-1105\_01 – Traffic Signals and Cable Assignments

- Revised grounding note for span and other minor revisions

### TR-1107\_01 – Pedestrian Push Buttons

- Updated pedestrian sign legends and notes.

TR-1114\_01 – Bonding and Utility Pole Attachment Details, Sign Hanger, “Y” Clamp  
Detail

- Revised wood pole grounding details, added ground rod.

06 - 6003-05-03-au2619-specs - ntc\_recentrevisionsdoc.doc

## **NOTICE TO CONTRACTOR – TRAFFIC SIGNALS**

The Contractor is hereby notified that certain conditions pertaining to the installation of new signals and maintenance of traffic signal operations are required when relevant, as part of this contract.

### **Qualified/Unqualified Workers**

#### **U.S. Department of Labor**

**Occupational Safety & Health Administration (OSHA) [www.osha.gov](http://www.osha.gov)**

**Part Number 1910**

**Part Title Occupational Safety & Health Administration**

**Subpart S**

**Subpart Title Electrical**

**Standard Number 1910.333**

**Title Selection and use of work practices**

**Completion of this project will require Contractor employees to be near overhead utility lines. All workers and their activities when near utility lines shall comply with the above OSHA regulations. In general, unqualified workers are not allowed within 10 feet of overhead, energized lines. It is the contractor's responsibility to ensure that workers in this area are qualified in accordance with OSHA regulations.**

**The electric distribution company is responsible to provide and install all necessary anchors and guy strands on utility poles. It is the Contractors responsibility to coordinate with the utility company to ensure proper placement of the anchor.**

#### **For utility poles owned and maintained by Frontier Communications:**

**Frontier will be responsible to provide and install the pole anchor. The installation of the guy wire will be the responsibility of the Contractor and should follow Frontier specifications.**

The Controller Unit (CU) shall conform to the current edition of the Functional Specifications for Traffic Control Equipment. The Functional Specifications require the CU meet NEMA Standard Publication No. TS2-1992 Type 2. The Functional Specifications are available on the Departments' web site <http://www.ct.gov/dot/site/default.asp>, click on "Doing Business with CONNDOT", under Engineering Resources click on "Traffic Engineering", Scroll down to Traffic Documents click on "Functional\_Specifications\_for\_Traffic\_Control\_Equip.pdf".

Utility poles cannot be double loaded without proper guying.

The contractor will be held liable for all damage to existing equipment resulting from his or his subcontractor's actions. A credit will be deducted from monies due the Contractor for all maintenance calls responded to by City of Stamford personnel.

The Contractor must install permanent or temporary spans in conjunction with utility company relocations. He then must either install the new signal equipment and controller or relocate the existing equipment.

The 30 Day Test on traffic control equipment, as specified in Section 10.00, Article 10.00.10 - TESTS, will not begin until the items listed below are delivered to the City of Stamford.

Five (5) sets of cabinet wiring diagrams. Leave one set in the controller cabinet.  
All spare load switches and flash relays.

07 - 6003-05-03-au2619-specs - ntc-traffic\_signals.docx

## **NOTICE TO CONTRACTOR – AS-BUILT PLANS**

The Contractor shall be responsible for furnishing as-built drawings upon completion of the project. The Contractor has an option to submit as-builts electronically or by hand and shall be maintained as the work progresses. The as-builts should clearly define any deviations from the original plans either geometrically (horizontal or vertical) or changes in materials used. **Final payment will not be released until the final as-built drawings have been furnished to the City.**

This work shall be performed on a continuing basis and shall be included in the general cost of the work. No separate payment will be made for As-Built Drawings. This information will be used by the Municipality and may serve as public information.

08 - 6003-05-03-au2619-specs - ntc\_as-builts.doc

## **NOTICE TO CONTRACTOR – WATER USAGE FEE**

The New Britain Water Department shall charge the contractor for a water usage permit for each 6 month period or partial period beginning January to June and July to December for their usage of water throughout the duration of the project until completion.

09 - 6003-05-03-au2619-specs - ntc\_water usage fee.doc

## **NOTICE TO CONTRACTOR – OVERTIME BY CITY EMPLOYEES**

In addition to any license or permit fees that may be required by the ordinances of the City of New Britain or by the rules or regulations of any department thereof, any person, firm or corporation or combination of them, who shall perform any work on any Saturday, Sunday, legal holiday or any other day when City departments are not working or who shall perform any work on any day at such times as to necessitate the employment of City personnel outside the hours of the normal eight (8) hour working shift for the assigned employee(s) in any day or forty (40) hours per week, shall pay to the City of New Britain or the proper department thereof any extra costs of inspection, supervision or employment of City personnel incurred by said City of New Britain or any department thereof.

The City of New Britain's recognized paid holidays are as follows: New Year's Day, Martin Luther King, Jr. Day, Lincoln's Birthday, Washington's Birthday, Good Friday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, the day following Thanksgiving, Christmas Day and any holiday officially proclaimed as such by the Congress of the United States or the Legislature of the State of Connecticut. Holidays falling on a Saturday will be celebrated on the preceding Friday, holidays falling on a Sunday will be celebrated on the following Monday.

10 - 6003-05-03-au2619-specs - ntc\_overtime by city employees.doc



## **SECTION 1.05 – CONTROL OF THE WORK**

**Article 1.05.02** - Plans, Working Drawings and Shop Drawings are supplemented as follows:

**Sub article 1.05.02** - (2) is supplemented by the following:

### **Traffic Signal Items:**

When required by the contract documents or when ordered by the Engineer, The Contractor shall prepare and submit product data sheets, working drawings and/or shop drawings for all traffic signal items, except Steel Span Poles and Mast Arm Assemblies when applicable, to the Division of Traffic Engineering for review before fabrication. The packaged set of product data sheets, working drawings and/or shop drawings shall be submitted in an electronic portable document format (.pdf).

The packaged set submitted in an electronic portable document format (.pdf) shall be in an individual file with appropriate bookmarks for each item. The electronic files for product data sheets shall be created on ANSI A (8 ½” x 11”; 216 mm x 279mm; letter) sheets. Working drawings and shop drawings shall be created on ANSI B (11” x 17”; 279 mm x 432 mm; ledger/tabloid) sheets.

Please send the pdf documents via email to:

#### City of New Britain

Mr. Carl Gandza  
City of New Britain – Engineering Project Manager  
27 West Main Street  
New Britain, Connecticut 06051  
(860) 612-5006

#### Engineer on Record

Kwesi Brown, P.E., PTOE  
Milone & MacBroom, Inc.  
99 Realty Drive  
Cheshire, CT 06410

### **Mast Arm Assemblies:**

When these items are included in the project, the submission for Mast Arm Assemblies shall follow the format and be sent to the “Engineer of Record” as described in the Steel Mast Arm Assembly special provision.

## **SECTION 1.06 – CONTROL OF MATERIALS**

**Article 1.06.01** - Source of Supply and Quality:

Add the following:

### **Traffic Signal Items:**

For the following traffic signal items the contractor shall submit a complete description of the item, shop drawings, product data sheets and other descriptive literature which completely illustrates such items presented for formal review. Such review shall not change the requirements for a certified test report and materials certificate as may be called for. All documents shall be grouped into one separate file for each group of items as indicated by the Roman numerals below (for example, one pdf file for all of the pedestal items). The documents for all of the traffic signal items shall be submitted at one time, unless otherwise allowed by the engineer.

- I. 10080XX – Rigid Metal Conduit
- II. 11051XXA – Traffic Signals, Mast Arm Mounted - LEDs, Housings and Hardware
- III. 1113XXXXA – Cable - Control Cable, Comm., CAT6, VC, Detector Cable (optical)

12 - 6003-05-03-au2619-specs - 1.06-control\_of\_materials.docx

## **SECTION 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES**

**Article 1.07.13** - Contractor's Responsibility for Adjacent Property, Facilities and Services is supplemented as follows:

The following company and representative shall be contacted by the Contractor to coordinate the protection of their utilities on this project 30 days prior to the start of any work on this project involving their utilities:

Mr. Gerald McDonald  
District 3 Electrical Supervisor  
Department of Transportation  
Milford, Connecticut  
(203) 882-2033

Ms. Lynne DeLucia  
Frontier Communications  
1441 North Colony Road  
Meriden, CT 06450-1979  
(203) 238-5000

Mr. Richard Slomiana  
Cablevision of Connecticut  
28 Cross Street  
Norwalk, CT 06851  
(203) 750-5617

Mr. Thomas Woronik  
Eversource Energy – Electric Distribution  
22 East High Street  
East Hampton, CT 06424  
(860) 267-3891

Mr. Thomas Costa  
Eversource Energy – Gas Distribution  
157 Cordaville Road  
Southborough, MA 01772  
(508) 305-7027

Mr. David Vega  
CenturyLink Communications  
71 Clinton Road  
Garden City, NY 11530  
(917) 207-4604

Mr. Eric Clark  
Crown Castle Fiber  
1781 Highland Avenue, Suite 102  
Cheshire, CT 06410  
(203) 649-3904

Mr. George Huss  
Zayo Group, LLC  
1060 Hardees Drive, Suite H  
Aberdeen, MD 21001  
(443) 403-2023

Mr. Carlos Vizcarrondo  
Aquarion Water Company of Connecticut  
600 Lindley Street  
Bridgeport, CT 06606  
(203) 337-5950

The following Department representative shall be contacted by the Contractor to coordinate an inspection of the service entrance into the controller/flasher cabinet for controllers within the State right-of-way, when ready for inspection, release, and connection of electrical service. The local Building Department shall be contacted for electrical service inspections for controllers located on Town roads located within the respective municipality.

Mr. Michael LeBlanc  
Property & Facilities  
Department of Transportation  
Newington, CT 06111  
860-594-2238  
Cell 860-983-5114

Please provide the electrical service request number provided by the power company. This is a Work Request (WR) Number provided by Eversource (formerly Northeast Utilities [CL&P]) or a Work Order Number provided by United Illuminating (UI). For State-owned traffic signals in CL&P territory, contact the Department's Traffic Electrical Unit to obtain the WR Number. For State-owned traffic signals in UI territory, contact the Department's Traffic Electrical Unit to obtain a Request for Metered Service to provide to UI to obtain the Work Order Number. The street address is required for release to local power companies (Groton Utilities or Wallingford Electric).

13 - 6003-05-03-au2619-specs - 1.07-legal\_relations\_&\_responsibilities.doc

## **SECTION 1.08 – PROSECUTION AND PROGRESS**

Article 1.08.03 - Prosecution of Work:

Add the following:

The Contractor will not be allowed to install traffic signal or pedestrian heads until the controllers are on hand and ready for installation. Once installation of this equipment commences, the Contractor shall complete this work in a most expeditious manner.

The Contractor shall notify the project engineer on construction projects, or the district permit agent on permit jobs, when all traffic signal work is completed. This will include all work at signalized intersections including loop replacements, adjusting existing traffic signals or any relocation work including handholes. The project engineer or district permit agent will notify the City and Division of Traffic Engineering to coordinate a field inspection of all work. Refer to Section 10.00 – General Clauses for Highway Illumination and Traffic Signal Projects, Article 10.00.10 and corresponding special provision.

14 - 6003-05-03-au2619-specs - 1.08-prosecution\_and\_progress-construction.doc

## **SECTION 10.00 – GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC SIGNAL PROJECTS**

### **Article 10.00.03 – Plans:**

In the first paragraph, replace the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> sentences with the following:

In the first paragraph, last sentence, in item no. 1, replace “Four (4)” with “Digital PDF Files and Five (5)” [paper prints of schematics and wiring diagrams...].

**Article 10.00.10 Section 3.** Functional Inspection, first paragraph after the 2<sup>nd</sup> sentence: Add the following:

The Contractor shall have a bucket truck with crew on site during the Functional Inspection to make any necessary aerial signal adjustments as directed by the Engineer.

**Article 10.00.12** - Negotiations with utility company: Add the following:

The Contractor shall give notice to utility companies a minimum of 30 days prior to required work or services to the utility company. Refer to Section 1.07 – Legal Relations and Responsibilities for the list of utility companies and representatives the contractor shall use.

The Contractor shall perform all work in conformance with Rules and Regulations of Public Utility Regulatory Authority (PURA) concerning Traffic Signals attached to Public Service Company Poles. The Contractor is cautioned that there may be energized wires in the vicinity of the specified installations. In addition to ensuring compliance with NESC and OSHA regulations, the Contractor and/or its Sub-Contractors shall coordinate with the appropriate utility company for securing/protecting the site during the installation of traffic signal mast arms, span poles or illumination poles.

When a span is attached to a utility pole, the Contractor shall ensure the anchor is in line with the proposed traffic signal span wire. More than 5 degree deviation will lower the holding strength and is not allowed. The Contractor shall provide any necessary assistance required by the utility company, and ensure the anchor and guy have been installed and properly tensioned prior to attaching the span wire to the utility pole.

## **ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC**

### **Article 9.71.01 – Description is supplemented by the following:**

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "Prosecution and Progress":

#### **Tilley Street at Green Street and Bank Street and Bank Street at Sparyard Street**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Where turn lanes exist, the Contractor shall provide an additional 10 feet of paved travel path to be used for turning vehicles only. This additional 10 feet of travel path shall be a minimum length of 150 feet. It shall be implemented so that sufficient storage, taper length, and turning radius are provided.

#### **All Other Roadways**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

#### **Commercial and Residential Driveways**

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.

**Article 9.71.03 - Construction Method is supplemented as follows:**

**General**

Unpaved travel paths will only be permitted for areas requiring full depth and full width reconstruction, in which case, the Contractor will be allowed to maintain traffic on processed aggregate for a duration not to exceed 10 calendar days. The unpaved section shall be the full width of the road and perpendicular to the travel lanes. Opposing traffic lane dividers shall be used as a centerline.

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific contract plans and provisions to temporarily lower these structures prior to the completion of work.

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway (bridge) section by the end of a workday (work night), or as directed by the Engineer.

When the installation of all intermediate courses of bituminous concrete pavement is completed for the entire roadway, the Contractor shall install the final course of bituminous concrete pavement.

When the Contractor is excavating adjacent to the roadway, the Contractor shall provide a 3-foot shoulder between the work area and travel lanes, with traffic drums spaced every 50 feet. At the end of the workday, if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary traversable slope of 4:1 or flatter that is acceptable to the Engineer.

The Contractor, during the course of active construction work on overhead signs and structures, shall close the lanes directly below the work area for the entire length of time overhead work is being undertaken. At no time shall an overhead sign be left partially removed or installed.

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g. fixed object or obstruct sight lines).

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

Construction vehicles entering travel lanes at speeds less than the posted speed are interfering with traffic and shall not be allowed without a lane closure. The lane closure shall be of sufficient length to allow vehicles to enter or exit the work area at posted speeds, in order to merge with existing traffic.



### **Existing Signing**

The Contractor shall maintain all existing overhead and side-mounted signs throughout the project limits during the duration of the project. The Contractor shall temporarily relocate signs and sign supports as many times as deemed necessary, and install temporary sign supports if necessary and as directed by the Engineer.

### **Requirements for Winter**

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the City of New London to determine what interim traffic control measures the Contractor shall accomplish for the winter to provide safety to the motorists and permit adequate snow removal procedures. This meeting shall be held prior to October 31 of each year and will include, but not be limited to, discussion of the status and schedule of the following items: lane and shoulder widths, pavement restoration, traffic signal work, pavement markings, and signing.

### **Signing Patterns**

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

## **TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS**

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

### **TRAFFIC CONTROL PATTERNS**

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided, and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pothole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made, and the equipment can be contained within the shoulder. Flashing lights and appropriate traffic person shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

### **PLACEMENT OF SIGNS**

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

### **ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS**

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans, and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists,

abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

**TABLE I – MINIMUM TAPER LENGTHS**

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

**SECTION 1. WORK ZONE SAFETY MEETINGS**

- 1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.
  
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:

- Review Project scope of work and time
- Review Section 1.08, Prosecution and Progress
- Review Section 9.70, Trafficpersons
- Review Section 9.71, Maintenance and Protection of Traffic
- Review Contractor's schedule and method of operations.
- Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
- Open discussion of work zone questions and issues
- Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

## **SECTION 2. GENERAL**

- 2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.
- 2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.
- 2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

## **SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS**

- 3.a) Lane Closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.
- 3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed:
  - As per the contract for such activities as blasting, steel erection, etc.

- During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
- To move slow moving equipment across live traffic lanes into the work area.

3.d) Temporary road closures using Rolling Road Blocks (RRB) may be allowed on limited access highways for operations associated with the installation and removal of temporary lane closures. RRB may be allowed for the installation and removal of lead signs and lane tapers only and shall meet the following requirements:

- RRB may not start prior to the time allowed in the contract Limitations of Operation for sign pattern installation. Sign pattern removal must be complete prior to the time indicated in the Limitations of Operation for restoring the lanes to traffic.
- On limited access highways with 4 lanes or more, a RRB may not start until the Limitations of Operation Chart allows a 2 lane closure. In areas with good sight lines and full shoulders, opposite side lead signs should be installed in a separate operation.
- Truck-Mounted Impact Attenuators (TMAs) equipped with arrow boards shall be used to slow traffic to implement the RRB. State Police Officers in marked vehicles may be used to support the implementation of the RRB. The RRB shall start by having all vehicles, including Truck-Mounted Impact Attenuators TMAs and police vehicles leave the shoulder or on-ramp and accelerate to a normal roadway speeds in each lane, then the vehicles will position themselves side by side and decelerate to the RRB speed on the highway.
- An additional Truck-Mounted Impact Attenuator TMAs equipped with a Portable Changeable Message Sign shall be utilized to advise the motorists that sign pattern installation / removal is underway. The Pre-Warning Vehicle (PWV) should be initially positioned in the right shoulder ½ mile prior to the RRB operation. If a traffic queue reaches the PWV's initial location, the contractor shall slowly reverse the PWV along the shoulder to position itself prior to the new back of queue. A Pre-Warning Vehicle, as specified elsewhere in the contract, shall be utilized to advise the motorists that sign pattern installation / removal is underway.
- The RRB duration shall not exceed 15 minutes from start of the traffic block until all lanes are opened as designated in the Limitation of Operation chart. If the RRB duration exceeds 15 minutes on 2 successive shifts, no further RRB will be allowed until the Contractor obtains approval for a revised installation procedure from the respective construction District.
- RRB should not be utilized to expand a lane closure pattern to an additional lane during the shift. The workers and equipment required to implement the additional lane closure should be staged from within the closed lane. Attenuator trucks (and State Police if available) should be used to protect the workers installing the taper in the additional lane.

- Exceptions to these work procedures may be submitted to the District Office for consideration. A minimum of 2 business days should be allowed for review and approval by the District.
  - The RRB procedures (including any approved exceptions) will be reviewed and discussed by the inspection team and the Contractor in advance of the work. The implementation of the agreed upon plan will be reviewed with the State Police during the Work Zone Safety meeting held before each shift involving temporary lane closures. If the State Police determine that alternative procedures should be implemented for traffic control during the work shift, the Department and Contractor will attempt to resolve any discrepancies with the duty sergeant at the Troop. If the discrepancies are unable to be resolved prior to the start of the shift, the work will proceed as recommended by the Department Trooper. Any unresolved issues will be addressed the following day.
- 3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.
- 3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

#### **SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW**

- 4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).
- 4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.
- 4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.

- 4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.
- 4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

**SECTION 5. USE OF TRUCK MOUNTED OR TRAILER MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)**

- 5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.
- 5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.
- 5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the “flashing arrow” mode when taking the lane. The sign truck and workers should be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the “caution” mode when traveling in the closed lane.
- 5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the “caution” mode when in the closed lane.
- 5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled “Truck-Mounted or Trailer-Mounted Impact Attenuator”. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.

- 5.f) TMAs should be paid in accordance with how the unit is utilized. If it is used as a TMA and is in the proper location as specified, then it should be paid at the specified hourly rate for “Truck-Mounted or Trailer-Mounted Impact Attenuator”. When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for “High Mounted Internally Illuminated Flashing Arrow”. If a TMA is used to install and remove a pattern and is also used as a Flashing Arrow in the same day, then the unit should be paid as a “Truck-Mounted or Trailer-Mounted Impact Attenuator” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove). If the TMA is also used as a Flashing Arrow during the same day, then the unit should be paid at the daily rate as a “High Mounted Internally Illuminated Flashing Arrow”.

#### **SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES**

- 6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
- 6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.
- 6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.
- 6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

#### **SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)**

- 7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.
- 7.b) CMS should not be installed within 1000 feet of an existing CMS.
- 7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.



- 7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.
- 7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.
- 7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).
- 7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).
- 7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.

7.i) The messages that are allowed on the CMS are as follows:

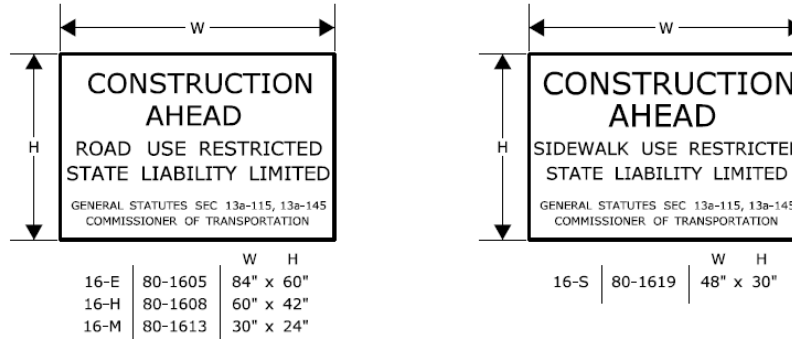
<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>	<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

## **SECTION 8. USE OF STATE POLICE OFFICERS**

- 8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.
- 8.b) Once the pattern is in place, the State Police Officer should be positioned in a non-hazardous location in advance of the pattern. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA should not be in proximity to each other.
- 8.c) Other functions of the State Police Officer(s) may include:
- Assisting entering/exiting construction vehicles within the work area.
  - Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.
- 8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.

### SERIES 16 SIGNS



THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMP PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMP, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

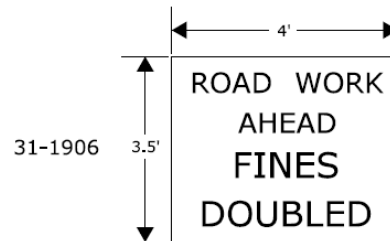
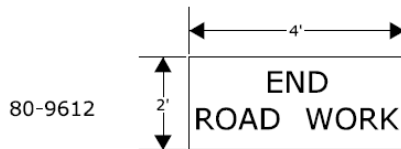
### REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

### "END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN  
REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

*Charles S. Harlow*  
Charles S. Harlow  
2012.06.05 11:35:43-04'00"  
PRINCIPAL ENGINEER

## NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
10. SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm



SCALE: NONE

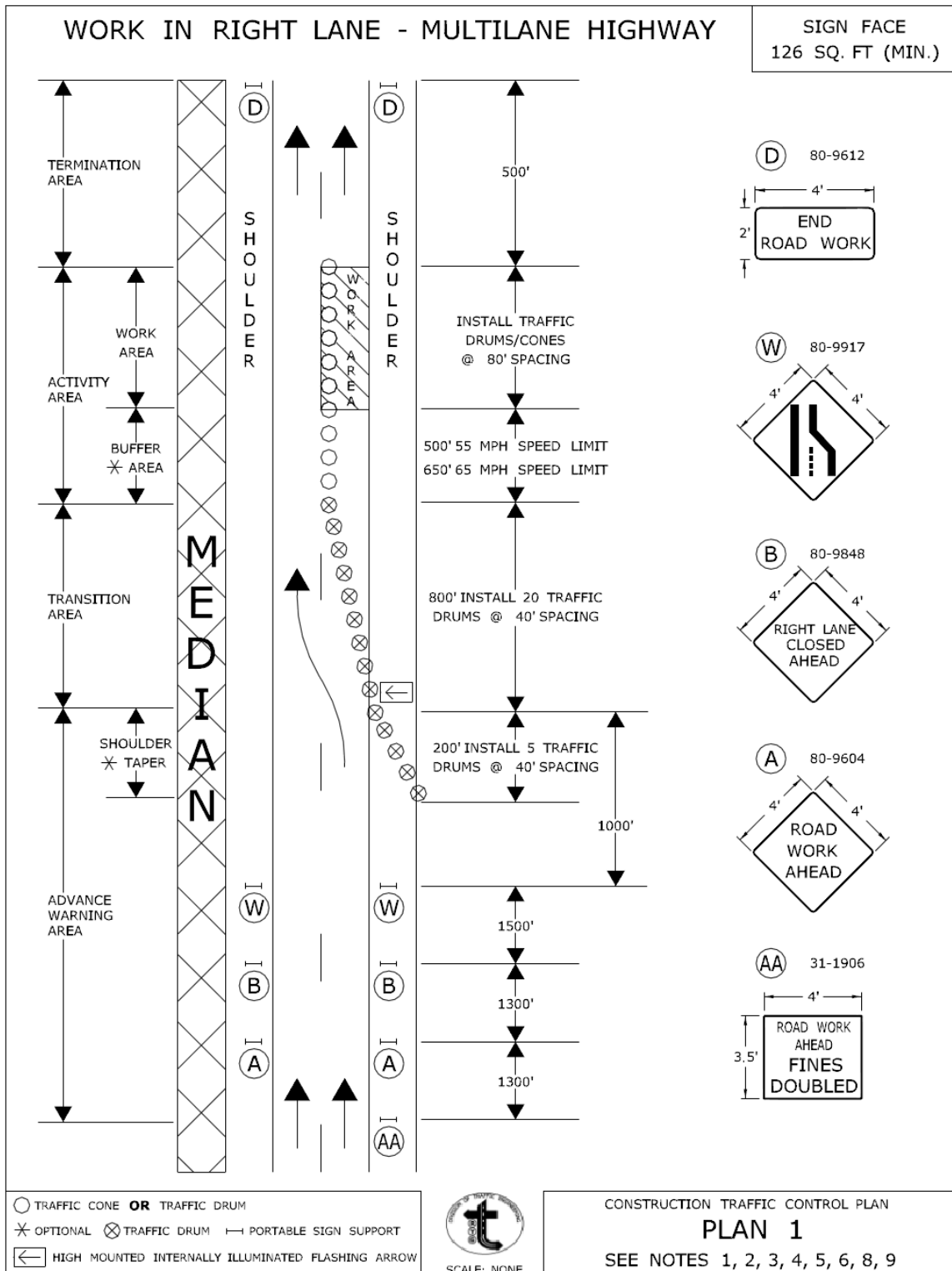
### CONSTRUCTION TRAFFIC CONTROL PLAN NOTES

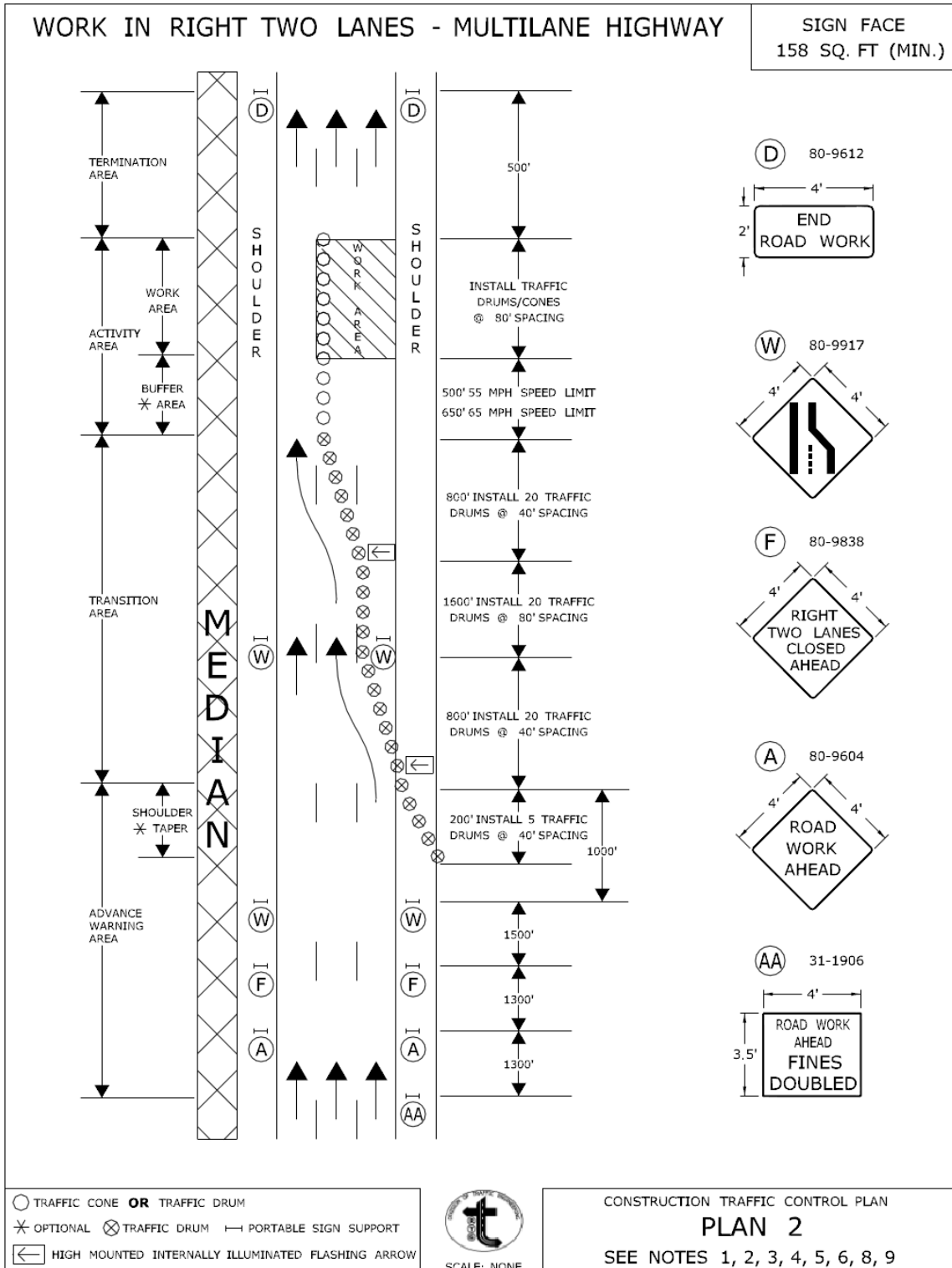
CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

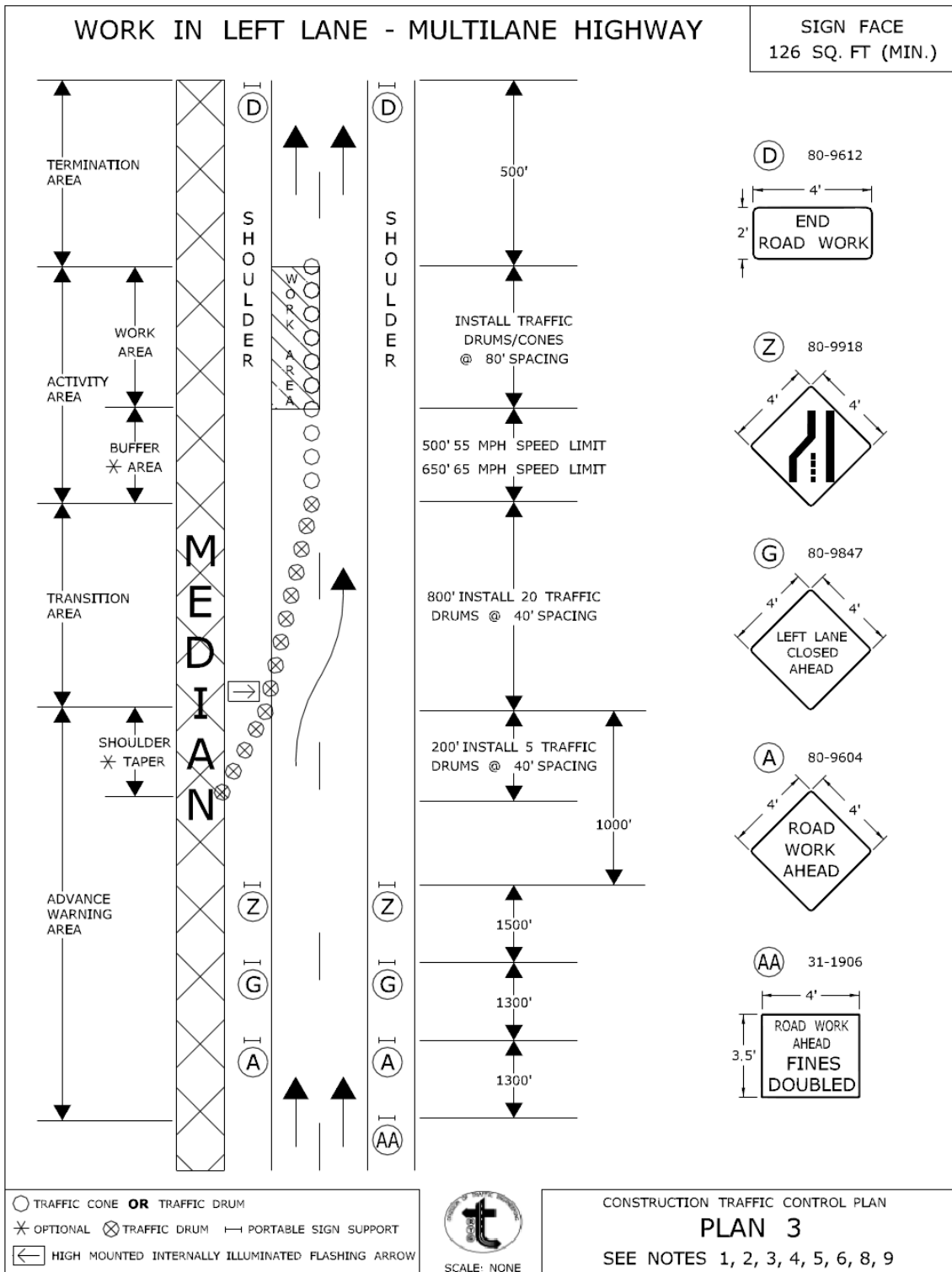
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PRINCIPAL ENGINEER

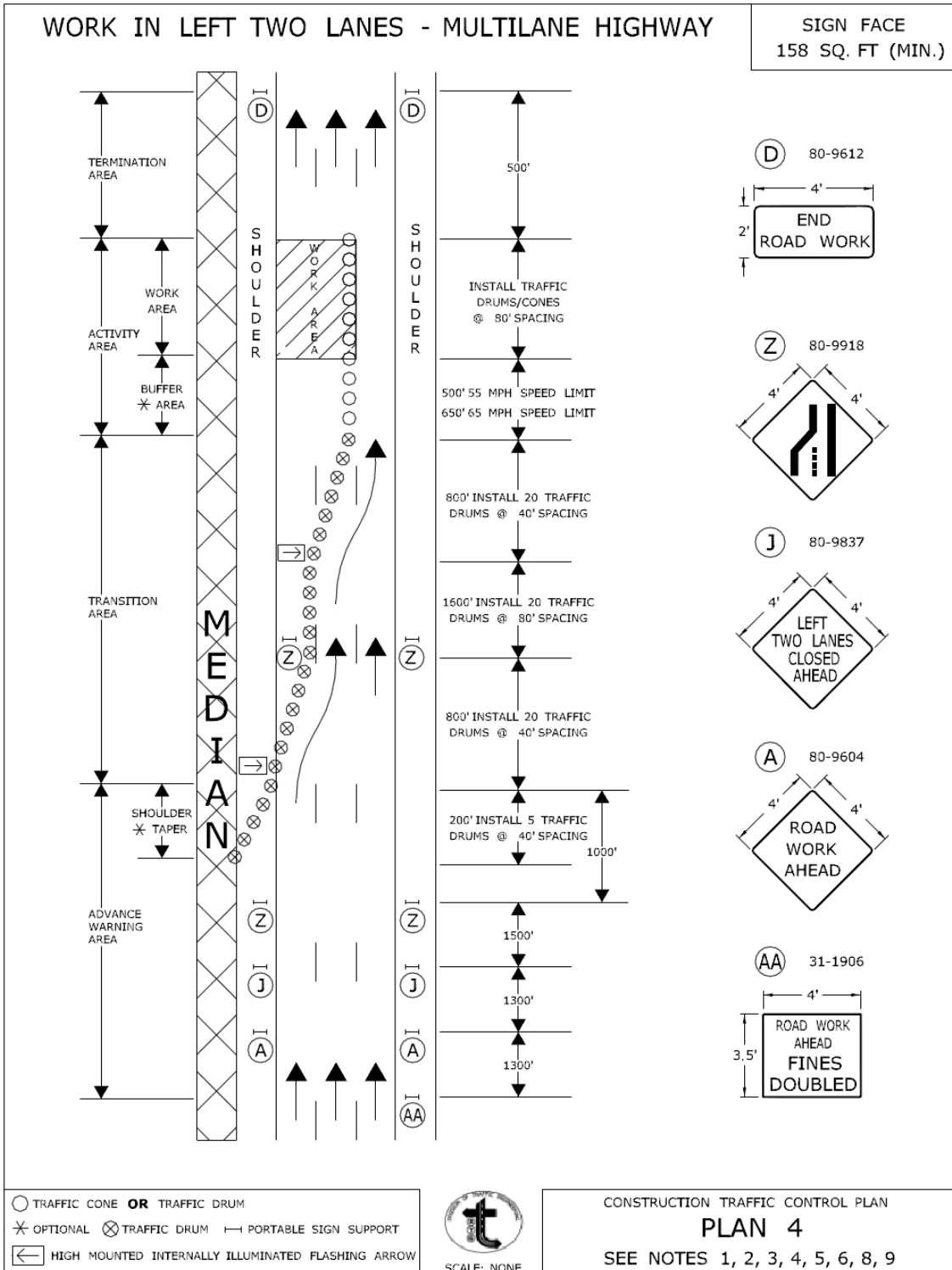
Charles S. Harlow  
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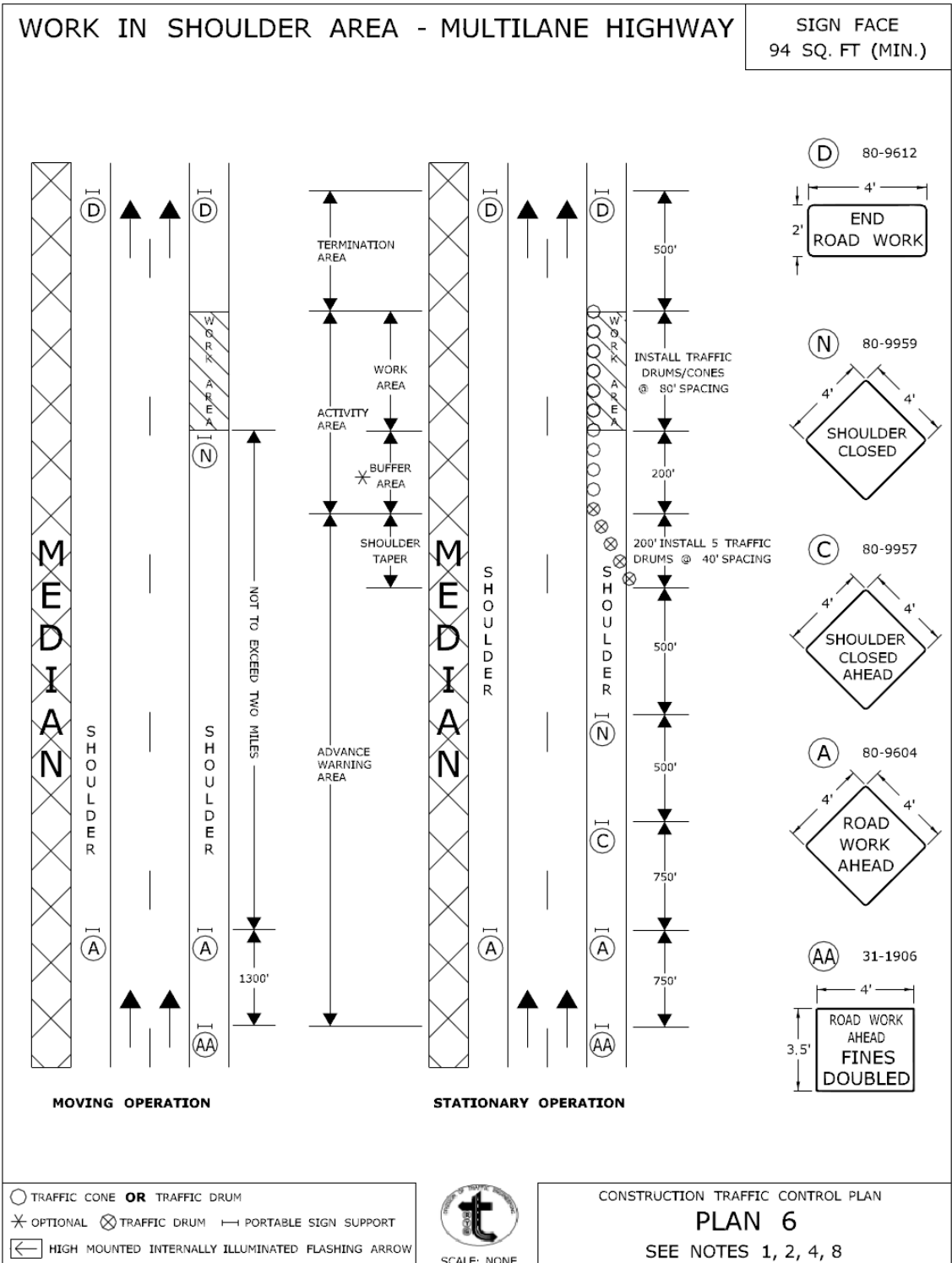


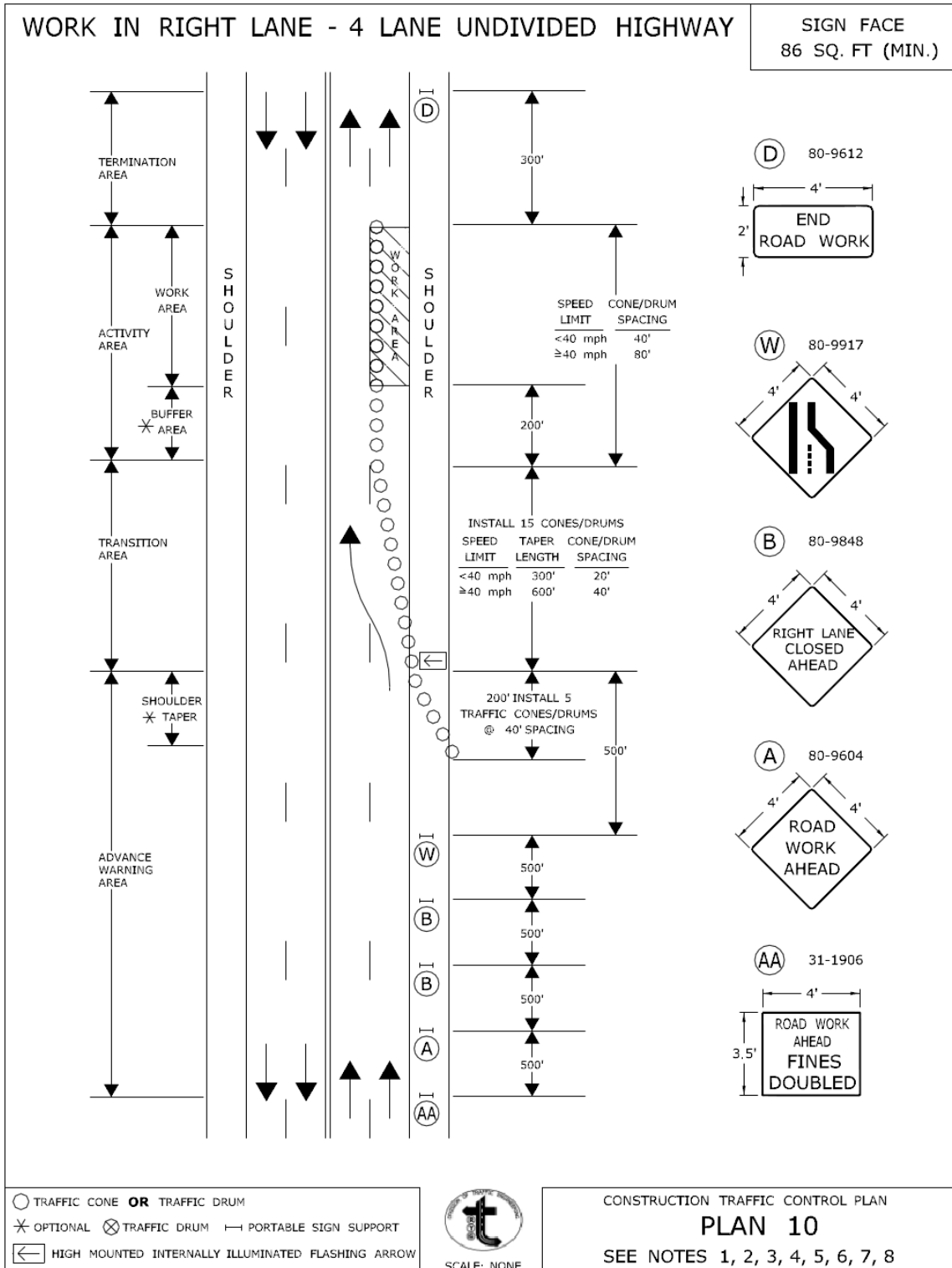












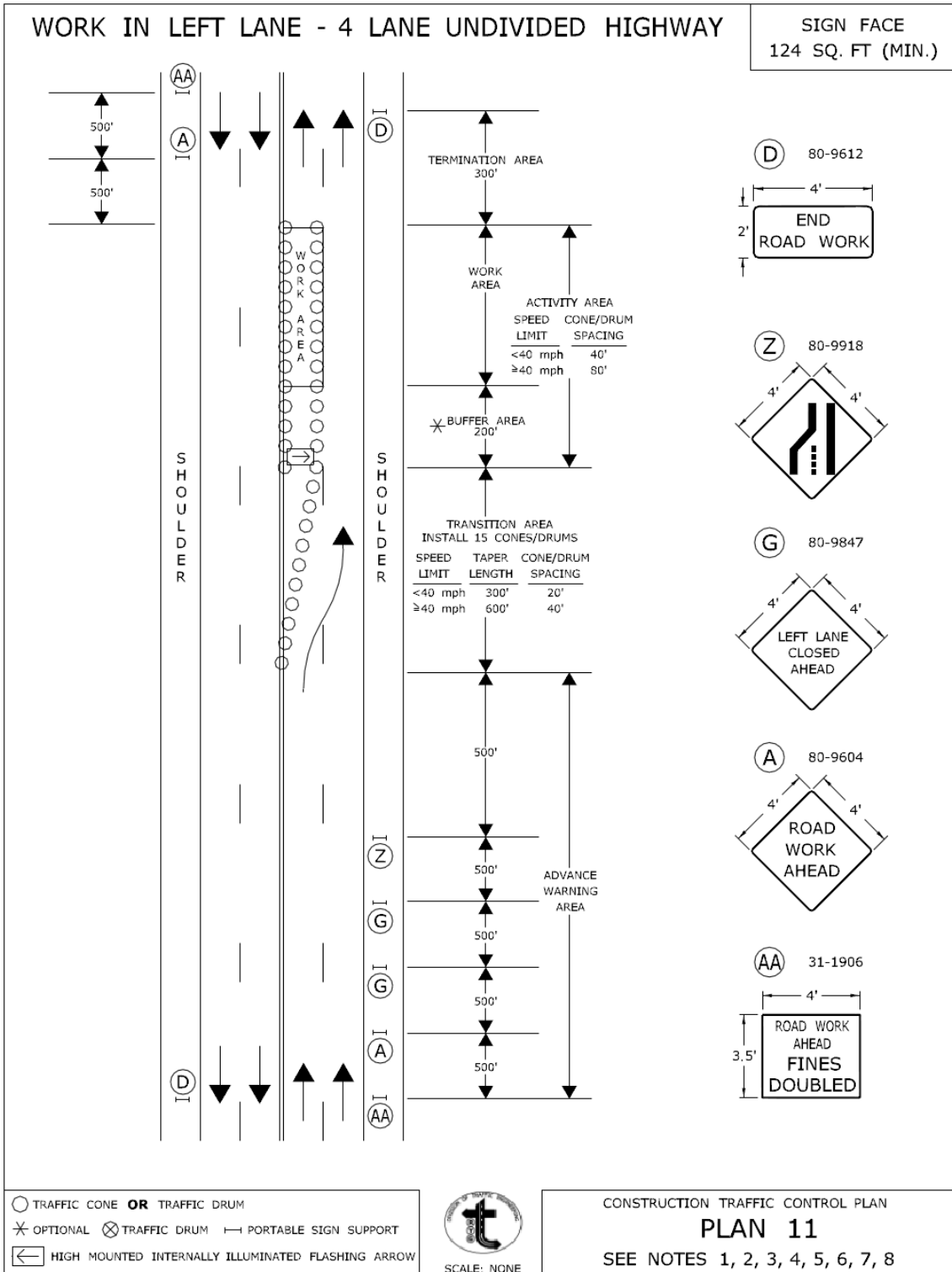
○ TRAFFIC CONE **OR** TRAFFIC DRUM  
 ✕ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT  
 ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 10**  
 SEE NOTES 1, 2, 3, 4, 5, 6, 7, 8

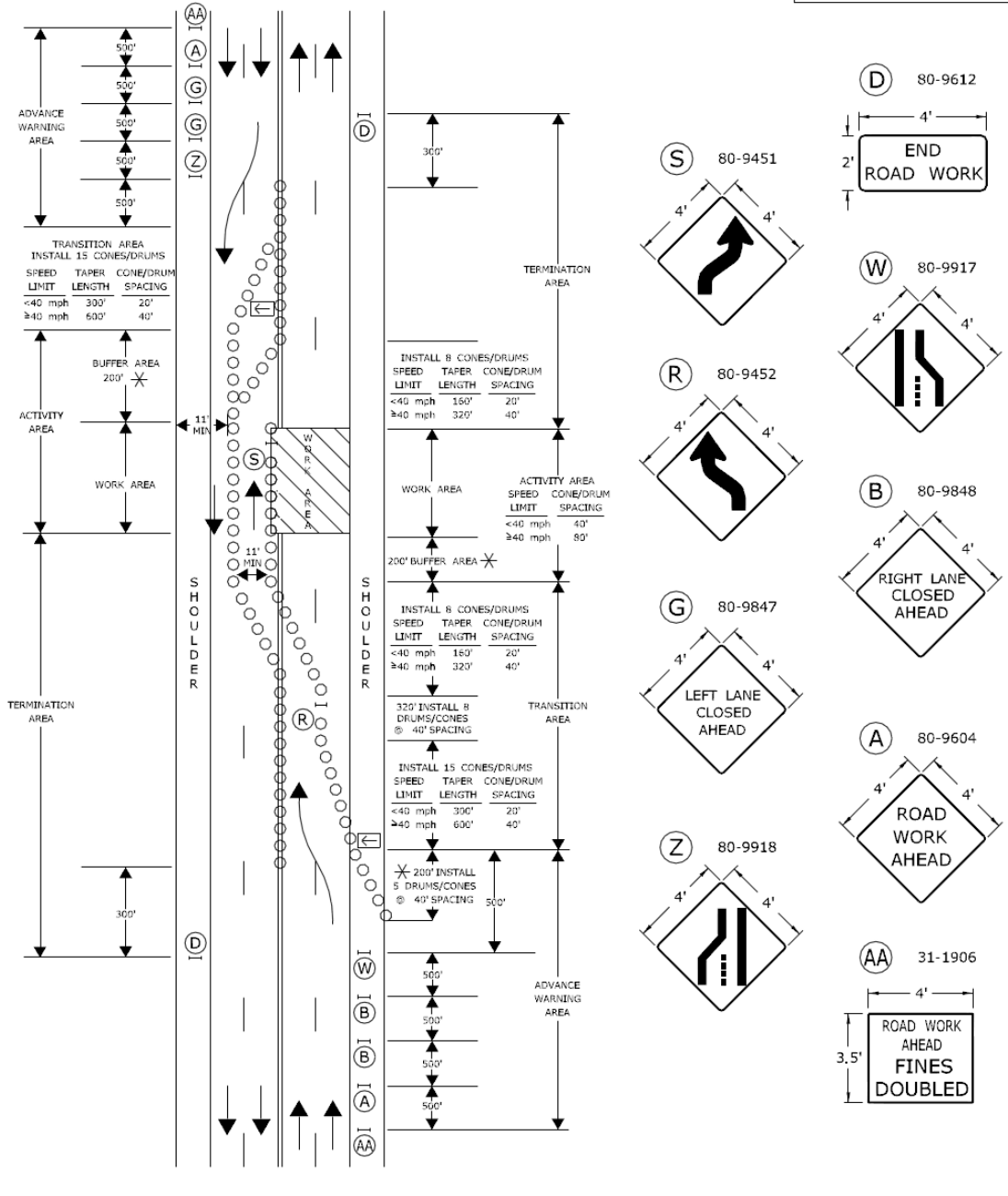
CONNECTICUT DEPARTMENT OF TRANSPORTATION  
 BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow  
 2012.06.05 15:54:15-0400  
 PRINCIPAL ENGINEER



**WORK IN BOTH LANES - 4 LANE UNDIVIDED HIGHWAY**

**SIGN FACE  
204 SQ. FT (MIN.)**



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ⬅ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

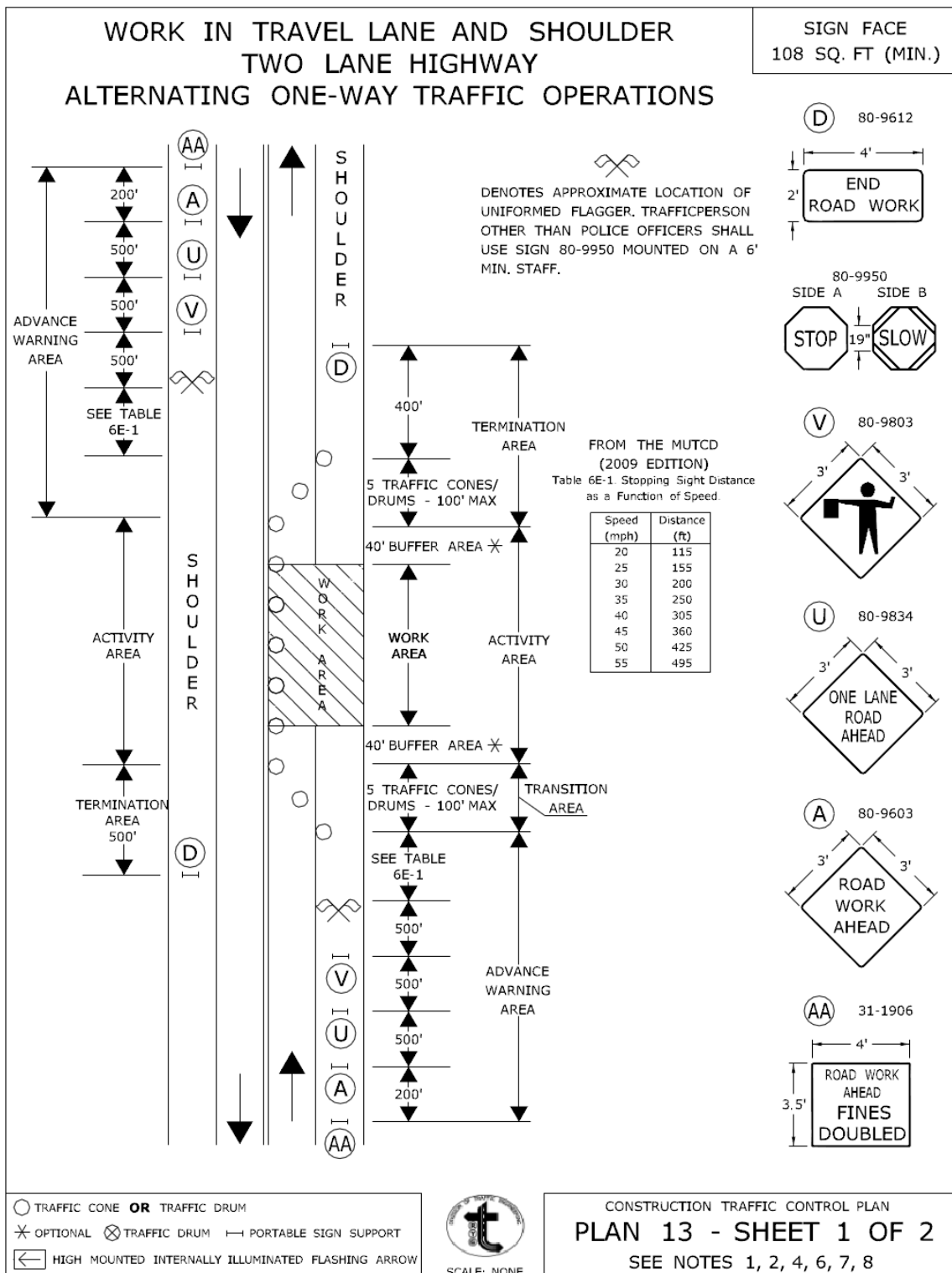


CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 12**  
SEE NOTES 1, 2, 3, 4, 5, 6, 7, 8

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APPROVED *Charles S. Harlow* Charles S. Harlow  
2012.06.05 15:55:01-0400  
PRINCIPAL ENGINEER

- (D) 80-9612  
4' x 2' END ROAD WORK
- (S) 80-9451  
4' x 4' Right Turn Arrow
- (W) 80-9917  
4' x 4' Lane Closure
- (R) 80-9452  
4' x 4' Right Turn Arrow
- (B) 80-9848  
4' x 4' RIGHT LANE CLOSED AHEAD
- (G) 80-9847  
4' x 4' LEFT LANE CLOSED AHEAD
- (A) 80-9604  
4' x 4' ROAD WORK AHEAD
- (Z) 80-9918  
4' x 4' Lane Closure
- (AA) 31-1906  
3.5' x 4' ROAD WORK AHEAD FINES DOUBLED



CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

*Charles S. Harlow*  
Charles S. Harlow  
2012.06.05 15:55:23-04'00"  
PRINCIPAL ENGINEER

## WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE  
108 SQ. FT (MIN.)

### HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

**A. TO STOP TRAFFIC**

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



**B. TO DIRECT TRAFFIC TO PROCEED**

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



**C. TO ALERT OR SLOW TRAFFIC**

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ✕ TRAFFIC DRUM    ⇨ PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

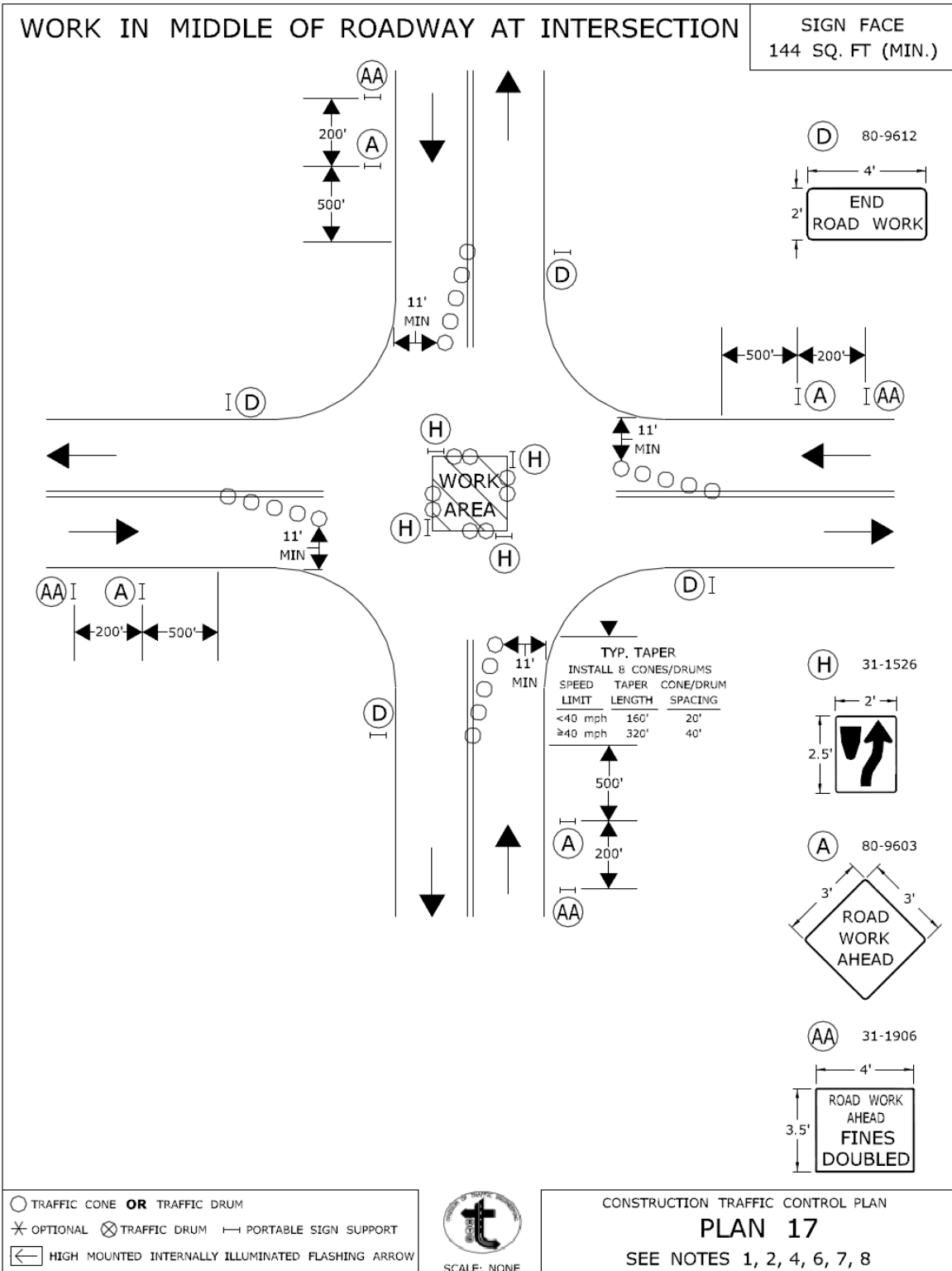


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 13 - SHEET 2 OF 2**  
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
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APPROVED Charles S. Harlow  
2012.06.05 15:55:45-04'00"  
PRINCIPAL ENGINEER



APPROVED *Charles S. Harlow* Charles S. Harlow  
2012.06.05 15:57:16-04'00"  
PRINCIPAL ENGINEER



**Article 9.71.05 – Basis of Payment is supplemented by the following:**

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic”. Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”

16 - 6003-05-03-au2619-specs - 0971001a-maintenance\_\_protection\_of\_traffic.doc

## **ITEM #1001001A – TRENCHING AND BACKFILLING**

*Section 10.01 is amended as follows:*

**10.01.01 – Description:** *Add after the first paragraph:*

Rock, insofar as it applies to trenching and backfilling, shall be defined as rock in definite ledge formation, boulders, or portions of boulders, cement masonry structures, concrete structures, reinforced concrete pipe, Portland cement concrete pavement or base, of 1/2 c.y. or more in volume, removed as indicated or directed from within the payment lines for trench excavation.

*Revise the third paragraph to add:*

“processed aggregate base, granular fill, suitable backfill material” after “crushed stone”.

**10.01.02 – Materials:** *Add the following:*

Processed Aggregate Base shall be as specified in M.05.01.

Granular fill shall be specified in M.02.01

**10.01.03 – Construction Methods:** *Replace the fourth paragraph with the following:*

Where trenching occurs in riprap or crushed stone areas, the surface material shall be replaced in kind. Where trenching in bituminous concrete sidewalk or paved areas, the trench shall be sawcut and backfilled to within the depth from the surface required to replace the removed sidewalk or pavement structure, which shall then be replaced. Suitable backfill material and granular fill shall be used for sidewalks and processed aggregate base shall be used as backfill material for pavement or bituminous concrete surfaces. The edges of all trenches in paved surfaces shall be sawcut to neat lines prior to paving. All trenches in existing paved surfaces, which parallel the curb, shall be no more than 1 1/2 feet from the curb, or when no curb is present, the apparent edge of road. The exception shall be to avoid existing appurtenances such as catch basins, water gates, manholes etc.

**10.01.04 – Method of Measurement:** *Replace the second sentence with the following:*

If rock, conforming to the description given under 10.01.01, is encountered, the Contractor shall strip it of sufficient overlying material to allow for proper measurement, and shall notify the Engineer that the rock surface is ready for measurement.

**10.01.05 – Basis of Payment:** *Replace the second paragraph with the following*

It shall also include all sand encasement, suitable backfill material, processed aggregate base, granular fill, backfilling, grading, seeding, fertilizing, mulching, clean-up and disposal of surplus

material, sawcutting sidewalks and paved areas, as well as furnishing and installing curbing, riprap, crushed stone, topsoil, sidewalk, pavement or structure, as the case may be.

*Replace the third paragraph with the following and remove the fourth paragraph entirely:*

When rock, conforming to the description given under 10.01.01 is encountered within the limits of trenching, its removal will be classified; and the accepted quantities of rock in trench excavation will be paid for at the Contract unit price per cubic yard for "Rock in Trench Excavation." In the absence of a "Rock in Trench Excavation" item, the work will be compensated as extra work.

17 - 6003-05-03-au2619-specs - 1001001a-trenching\_and\_backfilling.docx

**ITEM #1102002A – 8' ALUMINUM PEDESTAL**

**Article 11.02.02** – Materials: The materials for this work shall conform to the requirements of Article M.16.03.

**Article M.16.03** – Materials:

*Add the following paragraph:*

The shaft, base and all brackets and hardware shall be coated at the manufacturer's site prior to shipping and protected from damage during shipping. The color shall be **Black, Federal Standard No. 595, Color No. 37038** as approved by the City of New Britain. Submit the proposed coating process and a color sample on a representative material of the final products to the City of New Britain.

Pay Item  
8' Aluminum Pedestal

Pay Unit  
ea.

18 - 6003-05-03-au2619-specs - 1102002a - 8' aluminum pedestal.doc

## **ITEM #1002202A – TRAFFIC CONTROL FOUNDATION – MAST ARM**

### **Description:**

Work under this item shall consist of designing and constructing drilled shaft foundations for mast arm assemblies, in accordance with the details shown on the plans and as ordered by the Engineer.

### **Materials:**

The reinforcing steel shall be uncoated, ASTM A615, Grade 60 reinforcement conforming to the requirements of Article M.06.01.

The concrete for the drilled shaft shall conform to Article M.03 for Class 'F' Concrete. The 28 day minimum compressive strength of the concrete in the constructed foundation shall be 4,400 psi. The concrete mix design, including admixtures, shall be submitted to the Engineer for approval.

The slurry shall be Contractor designed mineral slurry that meets the range of values listed herein. The slurry mix design, including admixtures, shall be submitted to the Engineer for approval.

Rigid metal conduit, ground rod sleeves and related hardware, and end caps shall be galvanized steel conduit, and shall conform to Article M.15.09.

Ground rods shall be 0.625 in. diameter by 10.0 ft. long copper clad steel. The copper cladding shall be a minimum thickness of 0.128 in. The ground clamp shall be a square-head bolt type, approved for direct burial.

Bare copper wire shall conform to Article M.15.13.

Topsoil shall conform to Article M.13.01.

Fertilizer shall conform to Article M.13.03.

Seed mixture shall conform to Article M.13.04.

Mulch shall conform to Article M.13.05.

Erosion control matting shall conform to Article M.13.09.

### **Construction Methods:**

For the purpose of bidding this item, the Contractor shall assume that the subsurface conditions for each drilled shaft foundation location consists of cohesionless, medium dense, granular soil (AASHTO A-1 or A-2) with cobbles present and a high groundwater table which requires the use of wet construction/concreting methods. During excavation and construction of each foundation, should the Contractor encounter subsurface conditions that differ materially from those assumed at the time of bid, the Contractor shall notify the Engineer. All matters regarding increased cost relating to an agreed upon change in subsurface conditions will be handled per Section 1.04.04 – Differing Site Conditions.

The design of drilled shaft foundations shall conform to the requirements of AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals – latest edition, including the latest interim specifications, available prior to the advertising date of the contract, amended as follows:

1. The foundation shall be designed for the soils and rock properties and parameters based on the subsurface conditions (character of the soil and rock, presence of ground water, etc.) in the location of, adjacent to and below the drilled shaft foundation excavation. The need and extent of all subsurface explorations and investigations shall be determined by the Contractor.
2. The specified compressive strength,  $f'_c$ , of the concrete used in the design shall be 4,000 psi.
3. The reinforcement shall be uncoated and conform to ASTM A615, Grade 60.
4. The foundation shall be designed for the mast arm assembly reactions of all group loads and load combinations. The reactions shall include axial, shear, flexural and torsional load effects. No reduction of the reactions or increase in the allowable stresses of the materials is permitted.
5. The diameter of the drilled shaft foundation shall be 3.0 ft., unless otherwise allowed by the Engineer.
6. The design of the drilled shaft foundation shall include embedment of the foundation in soil, the embedment of the foundation in rock or the embedment of the foundation partially in soil and partially in rock, as applicable.
7. The design of the drilled shaft embedment depth shall account for the slope of the finished grade.
8. The minimum embedment for a drilled shaft foundation, constructed entirely in soil, shall be no less than 12.0 ft. below the finished grade at the low side of a

sloping grade. The minimum embedment for a drilled shaft foundation, constructed entirely in rock shall be no less than 8.0 ft. below the finished grade at the low side of a sloping grade.

9. The embedment depth for a drilled shaft foundation, determined by the Brom's design method, shall have a minimum factor of safety of 3.25 applied to the shear and moment load effects. The factor of safety applied to the torsional load effect shall be no less than 1.3.
10. The load factor method shall be used for the structural design of the drilled shaft foundation. The load factor applied to all loads, dead, wind and ice, and their effects, axial, shear, flexure and torsion, shall be no less than 1.6. The drilled shaft may be designed in accordance with the load factor method presented in the latest edition of the Building Code Requirements for Reinforced Concrete", ACI 318.
11. The structural design of the drilled shaft shall be based on stress and strain compatibility in the circular drilled shaft cross section.
12. The drilled shaft foundation shall be reinforced with longitudinal and transverse reinforcement. The area of longitudinal reinforcement should be no less than the sum of the reinforcement required for flexure and the longitudinal reinforcement required for torsion. The area of transverse reinforcement should be no less than the sum of the reinforcement required for shear and the transverse reinforcement required for torsion.
13. The minimum number of longitudinal reinforcing bars shall be 16. The minimum size of longitudinal reinforcing bars shall be #8. The minimum area of longitudinal reinforcing bars shall be no less than 1% of the gross cross-sectional area of the shaft. The minimum clear distance between longitudinal reinforcing bars shall be no less than 5 times the maximum aggregate size or 5 in., whichever is greater. The reinforcement shall extend full length of the drilled shaft foundation, including the pedestal. Splicing of the longitudinal reinforcement is not permitted.
14. The drilled shaft foundation shall be transversely reinforced with spirals or circular, one piece, enclosed ties. The minimum size of the transverse reinforcement shall be #4. The maximum spacing/pitch of the transverse reinforcement shall be no more than 6 in.. The minimum spacing/pitch of the transverse reinforcement shall be no more than 4 in.. The spiral reinforcement shall be terminated at the top and the bottom with 1 ½ turns of the reinforcing and a 135° standard hook. Spirals may be spliced with lap splices or mechanical connectors. For spirals, the minimum lap splice length shall be 1.7 times the tension development length (including modification factors) of the bar or 48 bar

diameters, whichever is greater. For spirals, the mechanical connectors shall develop both in tension and compression 125% of the specified yield strength of the bar and conform to the latest edition of the AASHTO LRFD Bridge Design Specifications, including the latest interim specifications. For ties, the minimum lap splice length shall be no less than 1.7 times the tension development length (including modification factors) of the bar. Tie lap splices shall be alternated.

15. The design of the foundation shall be coordinated with the traffic structure to avoid conflicts between the embedded support anchorage and the foundation reinforcement.

Prior to excavating for the foundation, the Contractor shall submit working drawings and design calculations, with all details and documents necessary for fabrication and construction, for each mast arm assembly foundation for review in accordance with the “Notice To Contractor – Special Provision 1.05” and the special provision “Section 1.05 – Control Of Work”.

The working drawings and design calculations for the mast arm assembly foundation shall conform to working drawing requirements for permanent construction. **A single set of drawings with tabulated data for multiple mast arm foundations is not permitted.** Each mast arm foundation shall be referenced with an alpha-numeric identifier noted on the Contract documents. The working drawings and calculations shall be prepared in Customary U.S. units.

The mast arm foundation working drawing and calculation submittal shall include the following:

1. title sheet
2. table of contents
3. contact information for designer – contact information shall include name and address of design firm, name of contact person with phone number and email address
4. copy of the certificate of insurance
5. foundation working drawings
6. foundation design calculations

The working drawings shall include complete details of all foundation components. The drawings shall include, but not be limited to the following:

1. the Project number, town and support identification number



2. reference to the design specifications, including interim specifications
3. material specifications for all components
4. embedment depths for foundation in soil, rock and a combination of soil and rock
5. anchor bolt details, including dimensions, embedment and projection

The design calculations shall include, but not be limited to the following:

1. the Project number, town and support identification number
2. references to design specifications, including interim specifications, and the applicable code section and articles
3. description/documentation for all computer programs used in the design
4. drawings/models of the foundation with dimensions, loads and references to the local and global coordinate systems used (as applicable), to facilitate review of the results
5. traffic structure reactions of all group loads and load combinations
6. soil and rock design parameters
7. calculations demonstrating the geotechnical and structural capacity of the drilled shaft is adequate for all group load combinations

Prior to excavating for the foundation, the Contractor shall submit the following:

**Reinforcing Steel Shop Drawings:** Based on the reviewed foundation design, the Contractor shall prepare reinforcing steel shop drawings for each foundation. The drawings shall be reviewed and stamped by the foundation designer. Four copies of each reviewed drawing shall be submitted to the Engineer at the District Construction office. One copy of each reviewed and stamped drawing shall be submitted to the “Engineer of Record”.

**Concrete and Slurry Mix Designs:** The Contractor shall submit to the Engineer at the District Construction office the concrete mix design and the slurry mix design, including admixtures, for review.

**Foundation Construction Procedure:** The Contractor shall submit to the Engineer at the District Construction office a written foundation construction procedure outlining the equipment; drilling procedure for soil and rock, including

removal of obstructions and removal of excavated spoils; temporary casing placement and removal; slurry placement; reinforcement, anchor bolt and conduit placement; and concrete placement required for the drilled shaft foundation construction for review. The procedure should include contingencies for the various soil, rock and subsurface water conditions that may be encountered during the foundation construction. Also required in this submission are the following;

The Engineer will evaluate the foundation construction procedure for conformance with the Contract documents and will then notify the Contractor of any additional information required and/or changes necessary to meet the Contract requirements. All procedural approvals given by the Engineer shall be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications. The Contractor shall not commence construction of the drilled shafts until the Engineer has accepted the foundation construction procedure.

Excavations required for shafts shall be performed through whatever materials are encountered, to the dimensions and elevations in the working drawings or as ordered by the Engineer. The methods and equipment used shall be suitable for the intended purpose and materials encountered. Shaft excavation may be performed by combinations of augering, rotary drilling, down-the-hole hammer, reverse circulation drilling, clamming, scraping, or other means approved by the Engineer. Generally, either the dry method, wet method, or temporary casing method may be used, as necessary, to produce sound, durable concrete foundation shafts free of defects. The Contractor shall select and use the method that is needed to properly accomplish the work, as determined by site conditions and subject to the approval of the Engineer. The Contractor is responsible for maintaining the stability of the shaft excavation during all phases of construction.

The dry method consists of drilling the shaft excavation, removing accumulated water and loose material from the excavation, and placing the shaft concrete in a relatively dry excavation. The dry construction method shall be used only at sites where the groundwater table and site conditions are suitable to permit construction of the shaft in a relatively dry excavation, and where the sides and bottom of the shaft are stable and may be visually inspected prior to placing the concrete. The use of the dry construction method is permitted if less than one foot of water accumulates in the bottom of a hole without pumping over a one hour period, the excavation remains stable and any loose material and water can be removed prior to placement of concrete.

The wet construction method shall be used at sites where a dry excavation cannot be maintained for placement of the shaft concrete. Wet construction methods consist of using a mineral slurry to maintain stability of the hole perimeter while advancing the excavation to final depth, placing the reinforcing cage and shaft concrete. This procedure may require desanding and cleaning the slurry; final cleaning of the excavation by means of a bailing bucket, air lift, submersible pump or other devices; and placing the shaft concrete with a tremie. Unless it is demonstrated to the satisfaction of the Engineer that the surface casing is not required, temporary surface casings

shall be provided to aid shaft alignment and position, and to prevent sloughing of the top of the shaft excavation. Surface casing is defined as the amount of casing required from the ground surface to a point in the shaft excavation where sloughing of the surrounding soil does not occur.

The temporary casing construction method shall be used at all sites where the dry or wet construction methods are inappropriate. Temporary casing construction method consists of advancing the excavation through caving material by the wet method. Temporary casing may be installed by driving or vibratory procedures in advance of excavation to the lower limits of the caving material. When a nearly impervious formation is reached, a casing is placed in the hole and sealed in the nearly impervious formation. After the drilling fluid is removed from the casing, drilling may proceed as with the dry method except that the casing is withdrawn when the shaft concrete is placed. If seepage conditions prevent use of the dry method, excavation is completed using the wet method. Temporary casing may be installed by driving or vibratory procedures in advance of excavation to the lower limits of the caving material. Slurry may be omitted if the casing can be installed with only minor caving of the hole.

If the Engineer determines that the foundation material encountered during excavation is unsuitable or differs from that anticipated in the design of the shaft, or if rock is encountered at an unanticipated elevation, the Contractor's foundation designer shall determine if the foundation embedment should be revised from that shown on the working drawings. If rock is encountered, the Engineer shall be notified to inspect and determine the elevation of the top of competent rock. Any revisions to the foundation embedment during construction shall be reviewed by the Engineer.

Excavated materials which are removed from the shaft excavation and any drilled fluids used shall be disposed of by the Contractor as directed by the Engineer and in accordance with Section 1.10.

Casings shall be metal, smooth, clean, watertight, and of ample strength to withstand both handling and driving stresses and the pressure of both concrete and the surrounding earth materials. The outside diameter of casing shall not be less than the specified size of the shaft. Temporary casings shall be removed while the concrete remains workable (i.e., a slump of 4 in. or greater). Before the casing is withdrawn and while the casing is being withdrawn, a 5.0 ft. minimum head of fresh concrete in the casing shall be maintained so that all the fluid trapped behind the casing is displaced upward without contaminating the shaft concrete. The required minimum concrete head may have to be increased to counteract groundwater head outside the casing. Separation of the concrete by hammering or otherwise vibrating the casing, during withdrawal operations, shall be avoided. Casing extraction shall be at a slow, uniform rate with the pull in line with the shaft axis.

Slurry used in the drilling process shall be a mineral slurry. The slurry shall have both a mineral grain size that will remain in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the

excavation and to allow proper concrete placement. The level of the slurry shall be maintained at a height sufficient to prevent caving of the hole.

The mineral slurry shall be premixed thoroughly with clean fresh water at a temperature above 41° F and adequate time allotted for hydration prior to introduction into the shaft excavation. The elevation of the slurry within the shaft foundation shall be maintained within 24 in. of the top casing and at least 48 in. above the existing water level during drilling and until the concrete placement is essentially complete. The slurry properties shall be maintained at all times, including non-working periods and stoppages. The slurry shall be circulated and agitated, continuously if necessary, to maintain the slurry properties and to prevent it from setting up in the shaft.

The Contractor, in the presence of the Engineer, shall perform control tests on the slurry to ensure that the density, viscosity, and pH fall within the acceptable limits tabulated below. The Contractor shall provide all equipment required to perform the tests. If desanding is required, sand content shall not exceed 4% (by volume) at any point in the shaft excavation as determined by the American Petroleum Institute sand content test.

Range of Values (at 68°F)

<b>Property (Units)</b>	<b>Time of Slurry Introduction</b>	<b>Time of Concreting (in Hole)</b>	<b>Test Method</b>
Density (pcf)	64.3 to 69.1	64.3 to 75.0	Density Balance
Viscosity (seconds per quart)	28 to 45	28 to 45	Marsh Cone
pH	8 to 11	8 to 11	pH paper or meter

The control tests to determine unit weight (density), viscosity, and pH values of the slurry shall be done during the shaft excavation to establish a consistent working pattern.

Prior to placing shaft concrete, slurry samples shall be taken from the bottom and at intervals not exceeding 10.0 ft. for the full height of slurry. Any heavily contaminated slurry that has accumulated at the bottom of the shaft shall be eliminated. The mineral slurry shall be within specification requirements immediately before shaft concrete placement.

The hole shall be covered when left unattended.

After completing the shaft excavation, all loose material existing at the bottom of the hole shall be removed.

Prior to placing the reinforcement into the shaft, the Contractor, in the presence of the Engineer, shall determine the shaft dimensions, depth and alignment of the shaft. The concrete shaft shall

not be out of plumb by more than 0.25 in. per foot of depth. The Contractor shall provide all equipment necessary for checking the shaft excavation. The Engineer shall inspect the shaft and verify that it has been properly cleaned.

The reinforcing steel shall be fabricated and assembled in accordance with Article 6.02.03. All reinforcement shall be assembled with wire ties. Welding to assemble the reinforcement is not permitted.

Immediately after the shaft excavation has been inspected and approved by the Engineer and prior to placement of the concrete, the assembled reinforcing steel cage, including cage stiffener bars, spacers, centralizers, and other necessary appurtenances, shall be carefully placed into the shaft excavation as a unit. Dropping or forcing cages into the shaft will not be allowed. The reinforcing steel in the shaft shall be tied and supported so that the reinforcing steel will remain within allowable tolerances of its intended position until the concrete will support the reinforcing steel. When concrete is placed by tremie methods, temporary hold-down devices shall be used to prevent uplifting of the reinforcing steel cage during concrete placement. Concrete spacers or other approved noncorrosive spacing devices shall be used at sufficient intervals not exceeding 5.0 ft. along the shaft to insure concentric location of the cage within the shaft excavation. When the size of the longitudinal reinforcing steel is larger than a #8 bar, such spacing shall not exceed 10.0 ft. After placement of the reinforcing cage, the Engineer shall inspect the shaft to ensure that it has remained clean. If the inspection indicates that loose material has accumulated at the bottom of shaft excavation, the Contractor shall remove the reinforcing cage and reclean the shaft.

If directed by the Engineer, the top of the shaft shall be formed square with the length of the sides matching the diameter of the shaft.

Concrete construction shall conform to Subarticle 6.01.03-2,3,4,5 and 6 as amended herein.

Concrete shall be placed in the shaft excavation as soon as possible, but no more than 4 hours after completion of excavation and cleaning of the bottom of the excavation, and no more than 2 hours after placement of the reinforcing steel cage. Concrete shall be placed in a continuous operation to the top of the shaft. The concrete level shall be horizontal during the pouring operations. Concrete placement shall continue after the shaft is full until good quality concrete is evident at the top of the shaft. The elapsed time from the beginning of concrete placement in the shaft to the completion of placement shall not exceed 2 hours.

In dry construction, concrete shall be placed in a single continuous operation with the flow of concrete down the center of the shaft excavation so as to consolidate the concrete on impact. During placement operations, the concrete is not permitted to hit the reinforcing steel. A dropchute, consisting of a hopper and flexible hose, may be used to direct the concrete down the center of the foundation and prevent the concrete from hitting the reinforcing steel. Accumulated water shall be removed before placing the concrete. At the time of concrete

placement, no more than 2 in. of water may exist at the bottom of the excavation and loose sediment no more than 0.5 in. over one-half the base is acceptable.

In wet (slurry) construction, concrete to be placed by the tremie method, where the concrete displaces the slurry from bottom of the excavation to the top. The concrete shall be placed through a top metal hopper and into a rigid leak-proof elephant trunk tremie tube, sufficiently large enough to permit free flow of concrete. The tremie tube shall be positioned so that it can be removed without disturbing the reinforcing. Initially, the discharge end of the tremie tube shall be sealed closed (plugged) to prevent slurry from entering the tube after it is placed in the excavation and before the tube is filled with concrete. After concrete placement has started, the tremie tube shall be kept full of concrete to the bottom of the hopper to maintain a positive concrete head. The flow of concrete shall be induced by slightly raising the discharge end of the tube, always keeping the tube end in the deposited concrete. No horizontal movement of the tremie tube will be permitted.

The shaft concrete shall be vibrated or rodded to a depth of 5 ft. below the ground surface except where soft uncased soil or slurry remaining in the excavation will possibly mix with the concrete.

Exposed concrete shall be cured and finished in accordance with Subarticle 6.01.03-7, 9 and 10.

Anchor bolt assemblies shall be embedded in the concrete as shown on the working drawings. A template plate shall be used to hold the anchor bolt assemblies, conduits and ground rod sleeve in the correct position. The anchor bolts shall be installed plumb.

All conduit ends terminating below grade shall be capped with a malleable iron caps. All above-grade conduit ends shall be terminated with an insulated bonding bushing with tinned insert.

Ground rod and ground wire shall be installed as shown on the plans.

No construction operations that would cause soil movement adjacent to the shaft, other than mild vibration, shall be conducted for at least 48 hours after shaft concrete has been placed.

The top of the foundations shall be backfilled and the adjacent disturbed ground surfaces restored to match the surrounding area after the concrete has cured and the forms are removed. Placement of topsoil shall conform to Articles 9.44.01 and 9.44.03. Turf establishment shall conform to Article 9.50.03.

The mast arm assemblies shall not be erected on the foundation until the concrete in the shaft has attained a 28 day compressive strength,  $f'_c$ , greater than or equal to 4,000 psi.

#### **Method of Measurement:**

This work will be measured for payment by the number of foundation units, each completely installed and accepted.

The work to remove rock from the foundation excavation will be measured from the top of rock to the bottom of rock excavation.

**Basis of Payment:**

The work will be paid for at the Contract unit price each for “Traffic Control Structure – Mast Arm,” completed and accepted in place, which price shall include all equipment, materials, tools and labor incidental to the subsurface exploration, design, fabrication, construction and disposal of drilling spoils, of the foundations at the locations specified on the plans.

Backfilling and restoration of adjacent ground surfaces (pavement, slope protection, topsoil & seed, etc.) in all areas disturbed by the work will not be paid for separately, but will be included as part of the work. The Engineer will determine the type, thickness and horizontal limits of the surfaces to be restored.

When rock is encountered within the limits of excavation, its removal will be paid for at the Contract unit price per vertical foot for "Rock in Foundation Excavation," which price shall include any additional excavation to remove the rock and any additional concrete required to fill the excavation beyond the designed foundation hole dimensions. Rock, in so far as it applies to "Rock in Foundation Excavation," shall be defined as rock in definite ledge formation, boulders, or portions of boulders, cement masonry structures, concrete structures or portland cement concrete pavement which has a cross-sectional area that exceeds 50% of the cross-sectional area of the designed foundation hole.

The reviewed and stamped working drawings and calculations shall be sent by the reviewer (Engineer of Record,) along with a recommendation regarding acceptance, to the Contractor. The reviewer (Engineer of Record) shall distribute copies of the working drawings and calculations. An electronic copy of each packaged set of working drawings and calculations shall be e-mailed to the following Department offices:

Bridge Safety and Evaluation – Robert.Zaffetti@ct.gov  
Research and Materials – Robert.Lauzon@ct.gov; DOT.MatTesting@ct.gov  
Traffic Engineering – DOT.TrafficElectrical@ct.gov  
Traffic Signal Lab – Sherri.Ruiz.Clark@ct.gov; Donald.Assard@ct.gov;  
Mark.Zampini@ct.gov  
District Maintenance Office

**ITEM #1104023A – 20’ STEEL MAST ARM ASSEMBLY**  
**ITEM #1104026A – 25’ STEEL MAST ARM ASSEMBLY**  
**ITEM #1104028A – 30’ STEEL MAST ARM ASSEMBLY**

**Description:**

Work under this item shall consist of designing, fabricating and installing a mast arm assembly to carry traffic appurtenances (such as traffic signals, signs, antenna, etc.) of the type specified, on a prepared foundation, in accordance with the details shown on the plans and as ordered by the Engineer.

**Materials:**

The tubular components, such as the pole, arm and luminaire arm shall be made of steel with a minimum yield stress no less than 35,000 psi. The multisided tubular members shall be fabricated from steel plate conforming to the requirements of ASTM A709, Grade 50T2.

The structural plate components, such as the baseplates, handhole frames, and the plates in the arm to pole ring stiffened, built-up box connection, shall be made of steel that conforms to the requirements of ASTM A709, Grade 50T2.

Anchorage plates shall conform to the requirements of ASTM A709, Grade 50T2.

The steel for arm and pole members; structural plate components, such as the baseplates, connection/flange plates, gusset plates, handhole frames and the plates in the arm to pole connection, shall meet Charpy V-notch impact testing requirements for non-fracture critical members in Zone 2 and the following:

<b>Yield Strength</b>	<b>Thickness in.</b>	<b>Minimum Average Energy, ft.-lbf</b>
$F_y \leq 36$ ksi	$\leq 4$	15 at 40°F
$36$ ksi < $F_y \leq 50$ ksi	$\leq 2$	15 at 40°F
$36$ ksi < $F_y \leq 50$ ksi	$2 < t \leq 4$	20 at 40°F
$50$ ksi < $F_y \leq 70$ ksi	$\leq 4$	15 at -20°F
Charpy V-notch sampling and testing shall be in accordance with AASHTO T243, “H” piece frequency.		

The non-structural components, such as hand hole covers, caps and anchor bolt covers, shall be made of steel with minimum yield stress of 35,000 psi.

The filler metal shall have a matching strength relationship with the base metal.



All high strength bolts shall conform to ASTM F3125 Grade A325, Type 1. Nuts shall conform to ASTM A563, Grade DH. Circular, flat, hardened steel washers shall conform to ASTM F436. The bolts, nuts and washers shall be galvanized in accordance with ASTM F2329 or ASTM B695, Class 55. The nuts shall be overtapped to the minimum amount required for the bolt assembly and all surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. The high strength bolts shall conform to the requirements of Subarticle M.06.02-3.

Compressible-washer-type direct tension indicators shall conform to ASTM F959, Type 325, and shall be galvanized in accordance with ASTM B695, Class 55.

U-bolts and threaded rods shall conform to ASTM A449. The nuts shall conform to ASTM A563, Grade DH. The washers shall conform to ASTM F436. The bolts, nuts and washers shall be galvanized in accordance with ASTM F2329 or ASTM B695, Class 55. The nuts shall be overtapped to the minimum amount required for the fastener assembly and all surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. The threaded ends of all U-bolts and threaded rods shall be supplied with 1 washer and 2 nuts.

The anchor bolts shall conform to ASTM F1554, Grade 105. The nuts shall conform to ASTM A563, Grade DH. The washers shall conform to ASTM F436. The bolts, nuts and washers shall be galvanized in accordance with ASTM F2329 or ASTM B695, Class 55. The nuts shall be overtapped to the minimum amount required for the bolt assembly and all surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. Prior to shipping the anchor bolts, the nuts and washers shall be installed by hand on the anchor bolts to ensure that the nuts can be run on the threads. Only anchor bolts on which the nuts are free running shall be shipped. The anchor bolts shall be shipped with the nuts and washers on the threads.

All steel components, including anchor bolts, shall be completely galvanized, after fabrication, in accordance with ASTM A123, ASTM F2329 or ASTM B695, Class 55, as applicable.

**The color of the finish coat for steel mast arms, anchor bolt covers, post caps and end caps shall be Traffic Signal Black No. 37038, Federal Standard No. 595A.**

**The powder coating facilities shall be owned and operated by the pole manufacturer to ensure quality coating system. Any coating damaged prior to or during installation shall be repaired.**

Repairs to damaged areas of the galvanized coatings shall conform to the requirements of ASTM A780 amended as follows:

Paints containing zinc dust, if used for repairs, shall contain either between 65% to 69% metallic zinc by weight or greater than 92% metallic zinc by weight in dry film.

The silicone sealant shall be a 1-component, 100% silicone sealant recommended for use with galvanized steel.

Neoprene gasket material for the access openings shall conform to ASTM D1056, Grade 2A2 or 2A3. Other grades of neoprene approved by the Engineer may be used.

Closed cell elastomer for sealing the space between the foundation and base plate shall conform to ASTM D1056, Grade 2A2 or 2A3 and shall have a pressure-sensitive adhesive backing on one side for adhesion to steel. Closed cell elastomer contained within the anchor bolt pattern shall not interfere with the anchor bolt leveling nuts and shall not block the opening in the base plate.

Bare copper grounding conductor shall be #8 AWG stranded bare copper wire conforming to M.15.13. The grounding bolt shall be stainless steel with a hex head.

All materials used in the finished structure shall be new. The use of materials that have been previously used in a structure or salvaged from a structure is not permitted.

The Contractor shall submit Certified Test Reports and Materials Certificates in conformance with Article 1.06.07 for the steel used in the mast arm members and components, high-strength bolts (including nuts and washers) and anchor bolts (including nuts and washers). The Certified Test Reports shall include the following:

- a. Mill test reports that indicate the place where the material was melted and manufactured.
- b. High-strength bolt test results for proof load tests, wedge tests, and rotational-capacity tests that indicate where the tests were performed, date of tests, location of where the components were manufactured and lot numbers.
- c. Galvanized material test results that indicate the thickness of the galvanizing.

Prior to incorporation into the work, the Contractor shall submit samples in conformance with Article 1.06.02 for the steel used in the mast arm members and components, high-strength bolts (including nuts and washers), anchor bolts (including nuts and washers), U-bolts (including nuts and washers) and threaded rods (including nuts and washers).

### **Construction Methods:**

The design and fabrication of the mast arm assembly, including its anchorage (into the foundation), shall conform to the requirements of the latest edition of the AASHTO LRFD

Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, including the latest interim specifications, available prior to the advertising date of the contract, amended as follows:

- The design of the mast arm system shall consider all load effects due to the Strength I, Extreme I, Service I, and Fatigue I limit states.
- The design wind speed shall be 150 mph For the Extreme I limit state and 80 mph for the Service I limit state.
- The design shall investigate the load effects resulting from applying the maximum and minimum load factors for each applicable limit state.
- The mast arms shall be designed to support fixed mounted traffic signals and signs. The wind drag coefficient,  $C_d$ , for traffic signals and luminaires shall be 1.2.
- The maximum arm length arm shall be 40.0 feet, measured from the centerline of the pole to the tip of the arm.
- The maximum luminaire arm length shall be 15.0 feet.
- The maximum diameter of the pole at its base shall be 18.00 inches.
- The maximum diameter of the arm at the arm-pole connection shall be 15.00 inches.
- The height and exposure factor,  $K_z$ , shall be determined based on the highest elevation of the structure or the appurtenances. The factor shall be considered constant in all pressure computations required for the design of the structure. The height and exposure factor shall be no less than 1.05.
- The mast arms shall be designed for fatigue importance category I for cantilevered structures. The mast arms shall be designed for the wind load effects due to galloping, natural wind gusts and truck-induced gusts. The luminaire arms shall be designed for the wind load effects due to natural wind gusts. The design pressure for the truck-induced gust shall be based on a truck speed of 65 mph. The design of the mast arms shall assume that vibration mitigation devices will not be installed.
- The vertical deflection of the free end of the arm due to the wind load effects of galloping and truck-induced gusts shall not exceed 8.00 inches.

- The minimum effective length factor,  $K$ , shall be as follows:

For the poles,  $k = 2.1$

For cantilevered mast arm member,  $k \geq 1.2$

- For any structure components subject to combined forces, the combined force interaction ratio due to each limit state shall not exceed 0.75. For any structure components not subject to combined forces, the ratio of the computed force (or stress) to the force (or stress) limit due to each limit state shall not exceed 0.75.
- All tubular members on a structure shall have the same material designation.
- The arm, luminaire arm and pole shall be tubular members with either round or multisided cross-sections. Multisided tubular members with other than 8, 12 or 16 sides are not permitted. Multisided tubular members with fluted sides are not permitted. The arm and luminaire arm shall be fabricated with a taper (change in diameter).
- Multisided tubular members with diameters less than or equal to 13.00 inches shall have a minimum of 8 sides. Multisided tubular members with diameters greater than 13.00 inches and less than or equal to 18.00 inches shall have no less than 12 sides.
- Multisided tubular members shall have a minimum internal bend radius of 5 times the tubular member thickness or 1.00 inch, whichever is greater.
- The minimum wall thickness of the arm at the pole connection and the pole shall be 0.3125 inches. The wall thickness of the pole and arm component members shall be uniform throughout their lengths. The use of multiple plies (laminations) to obtain the required arm and pole thickness is not permitted. The use of shop-fabricated stepped members is not permitted.
- Joining 2 tubular members together with a circumferential weld to fabricate a pole is not permitted.
- A maximum of 1 slip-type field splice is permitted in the arm. Slip-type field splices are not permitted in the pole.
- A maximum of 1 longitudinal seam weld is permitted in the arm. The pole may be fabricated with no more than 2 longitudinal seam welds. The seam welds shall be ground smooth and flush with the adjacent base metal. The use of external

longitudinal reinforcement bars at longitudinal seam welds is not permitted. The use of spiral seam welds is not permitted.

- The longitudinal seam welds within 6.00 inches of the member ends shall be complete joint penetration groove welds.
- Non-destructively test 100% of partial joint penetration longitudinal seam welds in accordance with the magnetic particle method. Non-destructively test 100 % of complete joint penetration seam welds in members less than 0.25 inches thick in accordance with the magnetic particle method on both the inside and outside surfaces. Non-destructively test 100% of complete joint penetration seam welds in members greater than or equal to 0.25 inches thick in accordance with the ultrasonic method in accordance with AWS D1.1 Annex S.
- All tubular member to transverse plate connections shall be made with a complete joint penetration groove weld with a backing ring attached to the plate with a continuous fillet weld. Non-destructively test 100% of the complete joint penetration groove welds by the ultrasonic method after fabrication and prior to galvanizing. Non-destructively test 100% of the complete joint penetration groove welds by the ultrasonic method for toe cracks after galvanizing. Non-destructively test 100% of backing ring fillet welds by the magnetic particle method after fabrication prior to galvanizing. After galvanizing, the joint between the backing ring and tubular member shall be sealed with silicone sealant to prevent the ingress of moisture.
- The use of stiffeners at tubular member to transverse plate connections is not permitted.
- The strength of a connection made with a complete joint penetration groove weld shall be no greater than the strength of the base metal. In connections joining base metal with different yield strengths, the base metal with the lower yield strength shall govern the design.
- The flange plate connection in the arm to pole in the ring stiffened, built-up box connection shall be designed as slip critical connections with standard holes. The minimum number of high-strength bolts in a flange splice shall be 8. Consideration should be given to the use of smaller diameter bolts since they require lower specified minimum bolt tensions.
- The minimum flange plate thickness shall no less than 2.00 inches. The determination of the plate thickness in the tubular member to transverse plate connections shall consider the potential for the plate to warp due to the heat from welding. Consideration should be given to the use of thicker plates to allow for

subsequent machining of warped plates to a flat surface so that removal of material will not compromise the required strength of the plate.

- The minimum thickness of the ring plates and gusset plates in the ring stiffened, built-up box connection shall be 0.5 inches.
- The size of fillet welds specified in designed connections shall be no less than 0.3125 inches. The use of seal and tack welds is not permitted. No welding shall be performed after galvanizing.
- The minimum base plate thickness shall be no less than 2.5 inches or at least as thick as the anchor bolt diameter, whichever is greater. The determination of the plate thickness in the tubular member to transverse plate connections shall consider the potential for the plate to warp due to the heat from welding. Consideration should be given to the use of thicker plates to allow for subsequent machining of warped plates to a flat surface so that removal of material will not compromise the required strength of the plate.
- The opening in the base plate shall be sized to allow for proper galvanizing and allow conduits projecting from the foundation to pass through it. The size of the opening shall be kept to a minimum to reduce the flexibility of the baseplate.
- The pole base plate anchor bolt circle diameter shall be 24.00 inches.
- The anchor bolt to base plate connection shall be designed as a double-nut connection with shear holes. The minimum distance from the center of the anchor bolt hole to the edge of the base plate shall be no less than 2 times the diameter of the anchor bolt. The anchor bolts shall use an embedded anchorage plate, 0.5 inches minimum thickness, to transmit loads from the pole base to the concrete foundation. The use of hooked anchor bolts is not permitted. The minimum number of anchor bolts shall be 8. The minimum anchor bolt diameter shall be 2.00 inches. The minimum anchor bolt embedment, the distance from the top of the foundation to the top of the embedded anchorage plate, shall be 3.5 feet or the tension development length of the vertical foundation reinforcement plus the end concrete cover, whichever is greater. Each anchor bolt shall be supplied with 4 nuts and 4 washers. Washers shall be placed on the top and bottom surfaces of the pole base plate and anchorage plate. Welding to the anchor bolts is not permitted. The use of lock washers with the anchor bolt assembly is not permitted.

The mast arm shall be designed for the load effects due to the actual traffic appurtenances (signals, signs, luminaires, cameras, etc.). The mast arm shall also be designed for load effects from future traffic appurtenances arranged, positioned and located as shown on the plans. The mast arm shall also be designed for load effects during all stages of construction that may exist

during the Project under which the mast arm is installed. The mast arm shall be designed to support traffic appurtenances with properties no less than those tabulated on the plans.

The dimensions of the mast arm assemblies are shown on the traffic plans, elevations, cross-sections or in the special provisions. The arm, luminaire arm and pole lengths and the attachment heights shall be verified by the Contractor based on the finished grade at the site, top of foundation elevation, the locations of overhead utility cables and the traffic appurtenance mounting heights. If either the arm or pole length is inadequate, the Contractor shall notify the Engineer.

The minimum vertical clearance from the top of the finished road to the bottom of the traffic signals shall be 16.0 feet. The maximum vertical clearance from the top of the finished road to the bottom of the traffic signals shall be 18.0 feet. The traffic signals shall be installed so that the bottom of all the signals for each approach is at the same elevation.

The arm to pole connection shall be made with a ring stiffened, built-up box. The luminaire arm to pole connection shall be made with either a built-up box or a ring stiffened built-up box. A minimum of 8 high-strength bolts shall be used to connect the arm flange plate to the built-up box connection plate. A minimum of 4 high-strength bolts shall be used to connect the luminaire arm flange plate to the built-up box connection plate. All fasteners and their components used in the each connection shall be visible. The use of tapped holes in the plates of each connection is not permitted. A hole(s) shall be provided in each connection to allow wires to pass from the pole to the arm and luminaire arm. The sides of all holes in each connection shall be ground smooth and the edges rounded by grinding to prevent the wires from chafing.

Vent and drain holes shall be provided for galvanizing. The number, size and location of vent and drain holes should be coordinated with the galvanizer prior to the submission of the working drawings and design computations. The area of vent and drain holes at each end of a member shall be at least 30% of the inside area of the member for members with diameters 3.00 inches and greater and 45% of the inside area of the member for members with diameters less than 3.00 inches. The vent and drain holes shall be strategically located for reducing stress and for proper galvanizing. The holes shall be made by drilling. Flame cut holes are not permitted. The edges of all holes shall be rounded by grinding. After galvanizing, exposed holes placed in the sign support components for galvanizing shall be sealed with neoprene plugs.

A J-hook shall be welded to the inside of the pole at the top for wire handling and support.

The mast arm shall have a handhole, reinforced with a frame, located at the base of the pole. The handhole shall be located with a normal direction that is 90° to the plane formed by the pole and arm. The clear distance from the top of the baseplate to the outside face of the bottom of the handhole frame shall be no less than the diameter of the tubular member plus 1.00 inch and no greater than the diameter of the tubular member plus 3.00 inches. The handhole frame shall have a minimum 4.00 inch wide by minimum 6.00 inch high clear opening. The maximum width of the handhole opening, the clear opening plus twice the frame thickness, shall not be greater than

40% of the tubular member diameter at that section. The inside corners of the handhole frame shall be rounded to a radius of 30% to 50% of the width of the clear opening. The minimum thickness of the handhole frame shall be no less than the thickness of the pole or 0.3125 inches, whichever is greater. The handhole frame shall be connected to the pole with a partial joint penetration groove weld reinforced with a fillet weld. The handhole weld shall start and end at the point that is coincident with the longitudinal axis of symmetry of the tubular member and the longitudinal axis of symmetry of the handhole frame. 100% of the weld shall be non-destructively tested in accordance with the magnetic particle method. The handhole shall be provided with a cover connected to the frame with no less than 2 stainless steel screws. The cover shall be installed with a neoprene gasket matching the dimensions of the cover. The cover and the gasket and the handhole frame shall be in firm and continuous contact after tightening the fasteners. The cover shall also be attached to the frame with a 1.5 foot long stainless steel chain. The inside bottom of the frame shall have a hole tapped for the stainless steel grounding bolt.

The mast arm shall be supplied with a pole cap plate, arm cap plate, and anchor bolt covers. The cap plates shall be attached with no less than 3 threaded fasteners. The joint between the tubular member and plate shall be sealed with a neoprene gasket matching the dimensions of the plate.

The design of the mast arm and the anchorage shall be coordinated with the design of the foundation to ensure that the foundation is adequate for the support reactions and to avoid conflicts between the embedded anchorage and the foundation reinforcement.

The luminaire arms shall be fabricated of pipe with a minimum thickness equal to schedule 40. Single arm luminaires shall be used for luminaires with arm lengths less than or equal to 8.0 feet. Truss type luminaires shall be used for luminaires with arm lengths greater than 8.0 feet. The truss type luminaires shall consist of an upper and lower members joined with vertical members at the tip and midspan. To accommodate the luminaire fixture, the size of the pipe in the luminaire arm at the tip shall be 2.00 inch diameter, schedule 40. If necessary, a reducing tenon shall be installed at the tip of the arm to accommodate the luminaire fixture.

The luminaire arm(s) shall be connected to the pole with clamp connections. Each clamp connection shall use 4 high-strength bolts. The installed nuts shall be prevented from loosening while in service. The use of lock washers to meet this requirement is not permitted. The arms shall be fillet welded, all-around, to the clamp(s). The size of the weld shall be no less than 0.25 inches. A hole shall be provided in the clamp, (upper arm clamp for truss type arms) and pole to allow for wires to pass from the pole to the luminaire arm. The sides of all holes in the connection shall be ground smooth and edges rounded by grinding to prevent the wires from chafing.

Prior to fabrication, the Contractor shall submit working drawings and design computations, with all details and documents necessary for fabrication and erection of the structure and its components, for each mast arm assembly for review in accordance with the "Notice To



Contractor – Special Provision 1.05” and the special provision “Section 1.05 – Control Of Work”.

The working drawings and design computations for the mast arm assemblies shall conform to working drawing requirements for permanent construction. **A single set of drawings with tabulated data for multiple mast arm locations is not permitted.** Each mast arm shall be referenced with an alpha-numeric identifier noted on the Contract documents. Combining working drawing submittals for mast arm structures with submittals for foundations is not permitted. The working drawings and computations shall be prepared in Customary U.S. units.

The mast arm working drawing and calculation submittal shall include the following:

- title sheet
- table of contents
- contact information for designer, fabricator and galvanizer – contact information shall include name and address of each firm and the name of contact person with phone number and email address
- copy of the certificate of insurance
- copy of fabricator’s AISC certification
- copy of the traffic signal control plan detailing mast arm assembly
- mast arm assembly working drawings
- mast arm assembly design computations
- welding procedures
- mast arm installation procedure, including the method to plumb the pole

The working drawings shall include complete details of all mast arm components. The drawings shall include, but not be limited to the following:

- the Project number, town and mast arm alpha-numeric identification number
- reference to the design specifications, including interim specifications
- reference to the design specifications design criteria, such as design wind speed, minimum design life, fatigue category, vehicle speed, etc.

- material specifications/designations for all components
- material specifications/designations for the arm and pole, with an explanation of the alpha numeric characters (equivalent thickness, in inches, shall be provided for gage numbers)
- non-destructive weld testing requirements
- details of the location of the longitudinal seam welds in the arm, luminaire arm and pole
- vent and drain holes for galvanizing
- dead load and permanent camber
- a plan view of the anchor bolt layout relative to the orientation of the arm
- anchor bolt dimensions, including embedment and projection
- mast arm installation procedure, including the method to plumb the pole

The design computations shall include, but not be limited to the following:

- the Project number, town and alpha-numeric mast arm identifier
- references to design specifications, including interim specifications, and the applicable code section and articles
- description/documentation for all computer programs used in the design
- drawings/models of the structure, components and connections, with dimensions, loads and references to the local and global coordinate systems used (as applicable), to facilitate review of the results
- a tabulation of the section properties of the tubular members at each analyzed section. The tabulated values shall include:
  - a. the diameter,  $D$  (if round member)
  - b. effective width,  $b_e$  (if multisided member, AASHTO 10.2.3)
  - c. equivalent diameter (if multisided member, AASHTO 5.6.2)
  - d. wall thickness,  $t$
  - e. inside bend radius,  $r_b$  (if multisided member, AASHTO C5.7.2)

- f. cross-sectional area,  $A$
- g. moment of inertia,  $I$
- h. section modulus,  $S$
- i. radius of gyration,  $r$

AASHTO Table B.2-1 may be used to determine the section properties. If Table B.2-1 is used, the radius measured to the mid-thickness of the wall shall also be provided.

- coefficients and factors used in the design
- results of all applicable limit states
- combined force interaction ratios for all applicable limit states
- horizontal and vertical deflections due to all applicable limit states
- vertical deflection of the free end of the arm due to the wind load effects of galloping and truck-induced gusts

The mast arm assemblies shall be fabricated in accordance with the latest edition of the AASHTO LRFD Bridge Construction Specifications, including the latest interim specifications, amended herein.

The steel fabricator shall be AISC certified for the fabrication to the Standard for Bridge and Highway Metal Component Manufacturers (CPT).

Fabrication of the mast arm may begin only after the working drawings and design computations have been reviewed and the Engineer has authorized fabrication to begin. The Contractor shall submit to the Engineer, no less than 2 weeks prior to the start of fabrication, the name and location of the fabrication shop where the work will be done so that arrangements can be made for an audit of the facility and the assignment of the Department Quality Assurance (QA) inspector. No fabrication will be accepted unless the QA inspector is present during fabrication. No changes may be made during fabrication without prior written approval by the Department.

The Contractor shall furnish facilities for the inspection of material and workmanship in the shop by the Engineer. The Engineer and Department QA representative shall be allowed free access to the necessary parts of the premises.

The Engineer will provide QA inspection at the fabrication shop to assure that all applicable Quality Control plans and inspections are adequately adhered to and maintained by the Contractor during all phases of the fabrication. A thorough inspection of a random selection of elements at the fabrication shop may serve as the basis of this assurance.

Prior to shipment to the project, each individual piece of steel shall be marked in a clear and permanent fashion by a representative of the fabricators' Quality Control (QC) Department to indicate complete final inspection by the fabricator and conformance to the Project specifications for that piece. The mark must be dated. A Materials Certificate in accordance with Article 1.06.07 may be used in lieu of individual stamps or markings, for all material in a single shipment. The Materials Certificate must list each piece within the shipment and accompany the shipment to the Project site.

Following the final inspection by the fabricator's QC personnel, the Engineer may select pieces of steel for re-inspection by the Department's QA inspector. Should non-conforming pieces be identified, all similar pieces must be re-inspected by the fabricator and repair procedure(s) submitted to the Engineer for approval. Repairs shall be made at the Contractor's expense.

The pieces selected for re-inspection and found to be in conformance, or adequately repaired pieces, may be marked by the QA inspector. Such markings indicate the Engineer takes no exception to the pieces being sent to the Project site. Such marking does not indicate acceptance or approval of the material by the Engineer.

All welding details, procedures and nondestructive testing shall conform to the requirements of AWS D1.1 Structural Welding Code - Steel.

Personnel performing the nondestructive testing shall be certified as a NDT Level II technician in accordance with the American Society for Non Destructive Testing (ASNT), Recommended Practice SNT-TC-1A and approved by the Engineer.

All nondestructive testing shall be witnessed by Engineer. Certified reports of all tests shall be submitted to the Engineer for examination. Each certified report shall identify the structure, member, and location of weld or welds tested. Each report shall also list the length and location of any defective welds and include information on the corrective action taken and results of all retests of repaired welds.

The Department reserves the right to perform additional testing as determined by the Engineer. Should the Engineer require nondestructive testing on welds not designated in the contract, the cost of such inspection shall be borne by the Contractor if the testing indicates that any weld(s) are defective. If the testing indicates the weld(s) to be satisfactory, the actual cost of such inspection will be paid by the Department.

All members and components shall be hot-dip galvanized in a single dip. Double-dipping of members and components is not permitted. All exterior and interior surfaces of the mast arm members and components, including the interior of the ring-stiffened built-up box connection, shall be completely galvanized.

Galvanized members and components shall be free from uncoated areas, blisters, flux deposits, and gross inclusions. Lumps, projections, globules, or heavy deposits of zinc which will interfere with the intended use of the material will not be permitted.

After galvanizing the joint between the backing ring and the tubular member shall be sealed with silicone sealant to prevent the ingress of moisture.

All damaged areas of the hot-dip galvanized surfaces shall be repaired in accordance with the requirements of ASTM A780. If paint containing zinc dust is used for repairs, the dry coating thickness shall be at least 50% greater than the thickness of the adjacent hot-dip galvanized coating, but no greater than 4.0 mils. The paint shall be brush applied. The use of aerosol spray cans shall not be permitted. The color of the finished repair area shall match the color of the adjacent hot-dip galvanized surface at the time of the repair to the satisfaction of the Engineer.

Prior to shipping, all galvanized surfaces of the members and components shall be inspected, in the presence of the Engineer, to determine the acceptability of the galvanized coating. Galvanized coatings may be found acceptable by the Engineer if all surfaces of the members and components meet the galvanizing requirements herein. Only mast arm members and components with acceptable galvanized coatings shall be shipped. If the galvanized coating on any member or component is found to be unacceptable, the Contractor shall submit a repair procedure to the Engineer for review.

After fabrication, the arm to pole bolted connection shall be assembled in the fabricator's shop, in the presence of the Engineer, to determine the acceptability of the connection. The faying surfaces shall be free of dirt, loose scale, burrs, other foreign material and other defects that would prevent solid seating of the parts. Prior to assembly, the galvanized faying surfaces shall be scored by wire brushing. The faying surfaces of the connection plates shall be checked with a straight edge to ensure that the surfaces are not distorted and the entire faying surface of each plate will be in contact when assembled. The high-strength bolts, including nuts and washes, shall be installed and tensioned in accordance with Subarticle 6.03.03-4(f). A connection may be found acceptable by the Engineer if the faying surfaces of the flange (connection) plates are in firm, continuous contact after properly tensioning the bolts. Only mast arm assemblies with acceptable arm to pole bolted connections shall be shipped. If a bolted connection is found unacceptable, the Contractor shall submit a procedure to repair the connection to the Engineer for review. The use or installation of galvanized hardened steel washer between the faying surfaces of the connection is not permitted. Galvanized surfaces damaged by the repair procedure shall be hot dip galvanized. Repair of the damaged galvanized surfaces in accordance with the requirements of ASTM A780 or with a galvanizing repair stick is not permitted. Bolts, nuts and washers used for the trial shop fit-up shall not be reused in the final field assembly.

After fabrication and prior to shipping, aluminum identification tags shall be attached to the arm and pole members with self-tapping tamper resistant screws.

The finished members and components shall be protected with sufficient dunnage and padding to protect them from damage and distortion during transportation. Damage to any material during transportation, improper storage, faulty erection, or undocumented fabrication errors may be cause for rejection of said material at the Project site. All costs associated with any corrective action will be borne by the Contractor.

Following delivery to the Project site, the Engineer will perform a visual inspection of all material to verify shipping documents, fabricator markings, and that there was no damage to the material or coatings during transportation and handling.

The Engineer is not responsible for approving or accepting any fabricated materials prior to final erection and assembly at the Project site.

High-strength bolts, nuts and washers shall be stored in accordance with Subarticle 6.03.03-4(f).

The mast arm shall be erected, assembled and installed in accordance with these specifications and the procedures and methods submitted with the working drawings. The Contractor and the mast arm designer are responsible to ensure that the erection and assembly procedures and methods in this specification are acceptable for use with the mast arm assembly. Changes to these method and procedures shall be submitted with the working drawings and computations.

Prior to installation of the mast arm pole, the exposed threads of all the embedded anchor bolts shall be cleaned of accumulated dirt and concrete and shall be lubricated. The threads and bearing surfaces of all the anchor bolt nuts shall be cleaned and lubricated. The anchor bolts and nuts are properly lubricated if the nuts can be turned by hand on the anchor bolt threads. The lubricant shall contain a visible dye of any color that contrasts with the color of the galvanizing. Re-lubricate the threads of the anchor bolts and nuts if more than 24 hours has elapsed since earlier lubrication, or if the anchor bolts and nuts have become wet since they were first lubricated.

Install (turn) the leveling nuts onto the anchor bolts and align the nuts to the same elevation or plane. The distance from the bottom of the leveling nuts to the top of the foundation shall not exceed 1.00 inch. Place a structural hardened washer on top of each leveling nut, 1 washer on each anchor bolt.

Prior to erecting the pole, place the closed cell elastomer ring within the anchor bolt pattern. The closed sell elastomer ring shall not interfere with the anchor bolt leveling nuts and shall not block the opening in the base plate.

The pole shall be erected so that the centerline of the pole will be plumb after the application of all the dead loads. The pole may be initially installed raked in the opposite direction of the overhead member to obtain the plumb condition. Raking the pole may be accomplished by installing the leveling nuts in a plane other than level.

Install the pole base plate atop the washers resting on the leveling nuts, place a structural hardened washer on each anchor bolt resting it on the top of the base plate, and install (turn) a top nut on each anchor bolt until the nut contacts the washer. The leveling nuts and washers shall be inspected, and if necessary the nuts (turned), so that the washers are in full contact with the bottom surface of the base plate.

Tighten the top nuts to a snug tight condition in a star pattern. Snug tight is defined as the maximum rotation resulting from the full effort of one person using a 12.00 inch long wrench or equivalent. A star tightening pattern is one in which the nuts on opposite or near-opposite sides of the bolt circle are successively tightened in a pattern resembling a star (e.g., For an 8-bolt circle with bolt sequentially numbered 1 to 8, tighten nuts in the following bolt order: 1, 5, 7, 3, 8, 4, 6, 2.).

Tighten leveling nuts to a snug tight condition in a star pattern.

Before final tightening of the top nuts, mark the reference position of each top nut in a snug-tight condition with a suitable marking on 1 flat with a corresponding reference mark on the base plate at each bolt. Then incrementally turn the top nuts using a star pattern one-sixth of a turn beyond snug tight. Turn the nuts in at least two full tightening cycles (passes). After tightening, verify the top nut rotation. The top nuts shall have full thread engagement. The distance from the bottom of the leveling nuts to the top of the foundation shall not exceed 1.00 inch.

High-strength bolts, including nuts and washes, shall be installed and tensioned in accordance with Subarticle 6.03.03-4(f). The arm shall be temporarily and fully supported while all the high-strength bolts are installed and tensioned. The temporary arm support shall not be removed until the Engineer has confirmed that the faying surfaces of the flange (connection) plates are in firm, continuous contact and the high-strength bolts were properly installed and tensioned. All high-strength bolts in the arm to pole bolted connection shall be inspected (in accordance with Subarticle 6.03.03-4(f)) to confirm the high-strength bolts were properly tensioned. The use or installation of galvanized hardened steel washer between the faying surfaces of the connection is not permitted.

After erecting the mast arm, the mast arm shall be electrically grounded by attaching the bare copper grounding conductor to the inside of the handhole frame with a stainless steel bolt and to the ground rod with a ground clamp. The rigid metal conduit shall be electrically grounded by attaching the bare copper grounding conductor to the insulated bonding bushing and to the ground rod with a ground clamp.

After erection of the mast arm and before the installation of the traffic appurtenances, if the structure exhibits excessive vibration, oscillations or deflections as determined by the Engineer, the Contractor shall immediately stabilize the structure to the satisfaction of the Engineer. Stabilizing the structure may require the removal of a portion of the structure or the entire structure.

The traffic appurtenances shall be located and mounted on the arm as shown on the cross-sections. Holes, if required for wires, shall be located adjacent to the appurtenances and shall be drilled in the bottom of the arm. A rubber grommet shall be installed in each hole to protect the wires from chafing.

After installation of the traffic appurtenances, the anchor bolt nuts (leveling and top anchor nut) and washers shall be in full contact with the top and bottom surfaces of the pole base plate and the centerline of the pole shall be plumb.

After installation of the traffic appurtenances, if the structure exhibits excessive vibration, oscillations or deflections as determined by the Engineer, the Contractor shall design and construct devices to mitigate the movements. The Contractor is responsible for immediately stabilizing the structure to the satisfaction of the Engineer. Stabilizing the structure may require the removal of the traffic appurtenances or the entire structure. Prior to installation of any mitigation device, the Contractor shall submit drawings, design computations other documentation to the Engineer for review in accordance with Article 1.05.02.

The last character of the mast arm identification number shall be stenciled with black paint, unless otherwise specified, on the pole of each mast arm. The character shall be 3.00 inches high and placed approximately 12.00 inches above the top of the base plate facing the centerline of the roadway.

**Method of Measurement:**

This work will be measured for payment by the number of steel mast arm assemblies of the type specified, completed and accepted in place.

**Basis of Payment:**

This work will be paid for at the Contract unit price each for "XX Steel Mast Arm Assembly", of the type specified, complete in place, which price shall include all equipment, materials, tools and labor incidental to the design, fabrication and installation, including mitigation devices if required, of the mast arms at the locations specified on the plans.

<u>Pay Item</u>	<u>Pay Unit</u>
XX Steel Mast Arm Assembly	ea.



**ITEM #1105101A – 1 WAY, 1 SECTION MAST ARM TRAFFIC SIGNAL**  
**ITEM #1105201A – 1 WAY, 1 SECTION POLE MOUNTED TRAFFIC SIGNAL**

**Article 11.05.03 – Construction Methods:**

In the second paragraph, delete the last sentence (“A balance adjuster shall...”).

Add the following paragraphs:

Circular indications that have an identification mark (such as an arrow) on the top of the lens shall be installed with that mark at the 12 o'clock position.

**Article 11.05.05 – Basis of Payment:**

In the first sentence of the first paragraph, delete “balance adjuster,”.

**Article M.16.06 - Traffic Signals**

**Sub Article 3 - Housing:**

In the last sentence, between the words “housing” and “shall” add “and all internal hardware”.  
Add the following after the last paragraph.

Each section of the housing shall be provided with a removable visor. The visor shall be the cap type, unless otherwise noted on the plan. The visor shall be a minimum .05 inch (.13 mm) thick. The visor shall be the twist on type and secured to the signal by four equidistant flat tabs screwed to the signal head.

**Sub Article 4 - Brackets:**

Add the following at the end of the last paragraph:

Backplates shall be 5” wide and louvered.

Install a 2” wide fluorescent yellow retroreflective strip (Type XI sheeting) along the perimeter of the face of the backplate.

Replace the last paragraph with the following:

When indicated on the plans, a backplate of dimensions, as shown on the plans, constructed of 5052-H32 aluminum alloy sheet between 0.050-in to 0.065-in thickness meeting the requirements of ASTM B209 shall be attached to the signal head housing. The front surface of

backplate per MUTCD shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background.

**Delete Sub Article 5 - Optical Unit and Sub Article 6 – Lamp Socket** and replace with the following:

Optical Unit, Light Emitting Diode:

**(a) General:**

Only Optical Units that meet the requirements contained herein supplied by the below manufacturers that have been tested by the Department's Signal Lab will be accepted. Final approval for model numbers will be done at the time of the catalog cut submittals.

Duralight  
Trastar, Inc.  
860 N. Dorothy Dr., Suite 600  
Richardson, TX 75081

GE Lighting Solutions  
Corporate Headquarters  
1975 Noble Road Building 338E  
East Cleveland, OH 44112-6300

Dialight  
1501 Foute 34 South  
Farmingdale, NJ 07727

Leotek  
726 South Hillview Drive  
Milpitas, CA 95035

The materials for Light Emitting Diode (LED), Optical Unit, circular and arrow, shall conform to the following:

- The ITE Performance Specification for Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement for circular indications dated June 27, 2005.
- The ITE Performance Specification for Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement for arrow indications dated July 1, 2007.

Section 4, Adjustable Traffic Signals and General Housing sections of the **Department of Transportation Functional Specifications for Traffic Control Equipment, current edition governs**. Where the Department of Transportation Functional Specifications conflict with this Special Provision or the 2005/2007 ITE Performance Specifications, this Special Provision and the 2005/2007 ITE Performance Specifications shall govern.

The Optical Unit shall have an Incandescent look and be made up of a smooth surfaced outer shell, multiple LED light sources, a filtered power supply and a back cover, assembled into a sealed unit. The Optical Unit shall be certified as meeting the 2005/2007 ITE Specifications by Intertek Testing Services, Inc. (ITSNA, formerly ETL) or another organization currently recognized by the Occupational Safety and Health Administration (OSHA) as a Nationally Recognized Testing

Laboratory (NRTL.) The Optical Unit shall perform to the requirements of the ITE Specification for a minimum of 60 months.

A “Swing Test” will be performed by the Department to ensure no significant dimming or blanking occurs, until the lamp is obscured by the visor. All L.E.D Lamps will be subjected to further field testing for reliable operation.

The Arrow Optical Unit shall be “Omni-Directional” so that it may be oriented in a right, left or straight configuration without degradation of performance.

**(b) Electrical Requirement:**

**Operating voltage:**

80 to 135 Volts AC with cutoff voltage (no visible indication) below 35Volts AC.

**Power requirements:**

Circular Indications: 12”, (300 mm) – no more than 16 Watts

Circular Indications: 8”, (200mm) - no more than 16 Watts

Arrows Indications: 12”, (300mm) - no more than 16 Watts

**Power Supply:**

Fused and filtered to provide excess current protection and over voltage protection from electrical surges and transient voltages.

**(c) Photometric Requirement:**

**Beam Color:**

Meet 2005/2007 ITE Specifications

**(d) Mechanical Requirements:**

**Diameter:**

The Circular Optical Unit shall fit into standard 12” (300mm) or 8” (200mm) housing.

The Arrow Optical Unit shall fit 12” (300mm) housings only.

**Enclosure:**

UV (Ultraviolet) stabilized polycarbonate back cover.

Clear lens cover for all Red, Yellow and Green Circular Optical Units.

For Arrow Optical Units the arrow indication segment of the lens shall be clear.

Enclosure sealed and waterproofed to eliminate dirt contamination and be suitable for installation in all weather conditions.

Clearly mark on the housing the following information:

- Manufacturer & model number
- Date of manufacture (must be within one year of installation)

The model number shall end with the number of LEDs used to comprise the unit as the last digits of the model number. Example, if the unit comprised of 3 LEDs and the model is x12y, then the new model number shall read x12y3.

**Operating temperature:**

Meet 2005/2007 ITE Specification

**Wiring:** L.E.D. lamps shall have **color coded 16 AWG wires** for identification of heads as follows:

RED L.E.D. Lamps	RED with WHITE neutral
YELLOW L.E.D. Lamps	YELLOW with WHITE neutral
GREEN L.E.D. Lamps	GREEN or Brown with WHITE neutral
RED L.E.D. ARROWS	RED/WHITE with WHITE neutral
YELLOW L.E.D. ARROWS	YELLOW/WHITE with WHITE neutral
GREEN L.E.D. ARROWS	GREEN/WHITE or BROWN/WHITE with WHITE neutral
GREEN/YELLOW LED ARROWS	GREEN/WHITE or BROWN/WHITE, YELLOW/WHITE, with WHITE neutral

Wires shall be terminated with a Block Spade, 6-8 stud/ 16-14 wire size.

All Circular Optical Units shall be supplied with a minimum 40” pigtail and all Arrow Optical Units Supplied with a minimum 60” pigtail.

**Sub Article 9 - Painting:**

**Third coat:**

Replace with the following:

The housing, housing door, the back surface of the backplate, and all brackets and hardware shall be painted black by the manufacturer. The color shall be No. 17038, Federal Standard No. 595.

The outside of the visors shall have a dull black finish that meets Federal Specification TT-E-527.

The inside of the visors per MUTCD shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background. The dull black finish shall meet Federal Specification TT-E-527.

**ITEM #1106001A – 1 WAY PEDESTRIAN SIGNAL POLE MOUNTED**  
**ITEM #1106002A – 2 WAY PEDESTRIAN SIGNAL POLE MOUNTED**  
**ITEM #1106004A – 2 WAY PEDESTRIAN SIGNAL PEDESTAL**  
**MOUNTED**

**Section 11.06.02 Pedestrian Signal, Materials**

Section M.16.07 C. Optical Unit

Delete 2. LED: and replace with the following:

General

- Meet requirements of current MUTCD Section 4E.
- Meet current ITE specifications for Pedestrian Traffic Control Signal Indications - (PTCSI) Part 2: Light Emitting Diode (LED).
- Meet CT DOT, 2008 - 2010 Functional Specifications for Traffic Control Equipment; Section 5D, LED Pedestrian Signal with Countdown Timer.
- Meet EPA Energy Star® requirements for LED Pedestrian Signal Modules.

Operational

- Countdown display only during the flashing Pedestrian Clearance (Ped Clr) Interval. Timer goes blank at end of flashing ped clr even if countdown has not reached zero.

Physical

- Sealed optical module to prevent entrance of moisture and dust.
- Self-contained optical module, including necessary power supplies.
- Designed to securely fit into standard housing without the use of special tools or modifications to the housing.
- Identification information on module: manufacturer's name, model number, serial number, and date code.

Optical

- Multiple LED sources; capable of partial loss of LED's without loss of symbol or countdown message.
- Two complete self-contained optical systems. One to display the walking person symbol (walk) and the hand symbol (don't walk). One to display the countdown timer digits.
- Visual Image similar to incandescent display; smooth, non-pixelated.
- Symbol and countdown digit size as shown on the plan.
- Solid hand/person symbol; outline display not allowed.
- Overlaid hand/person symbols and countdown digits arranged side by side.

- Countdown digit display color: Portland Orange in accordance with ITE requirements.
- Countdown digits comprised of two seven segments, each in a figure 8 pattern.
- Photometric Requirements: Luminance, Uniformity, and Distribution in accordance with ITE requirements.
- Color Uniformity in accordance with ITE requirements.
- Blank-Out design; symbols and digits illegible even in direct sunlight when not illuminated.

#### Electrical

- Operating voltage: 89 VAC to 135 VAC.
- Low Voltage Turn-Off: 35 VAC.
- Turn-On and Turn-Off times in accordance with ITE specifications.
- Combined Hand – Countdown Digits wattage:  $\geq$  20 Watts.
- Input impedance at 60 Hertz sufficient to satisfy Malfunction Management Unit (MMU) requirements.
- Two separate power supplies. One to power the walking person symbol. One to power the hand symbol and the countdown digits.
- Meet Federal Communication Commission (FCC) regulations concerning electronic noise.
- Filtered and protected against electrical transients and surges.

#### Warranty

- Five years from date ownership is accepted.

#### Section M.16.07 F. Painting:

Remove the 2<sup>nd</sup> and 3<sup>rd</sup> sentences referring to the color.

**Third coat:** Replace with the following:

The housing and all brackets and hardware shall be painted black by the manufacturer. The color shall be No. 17038, Federal Standard No. 595.

The inside and outside of the visors shall be flat black No. 37038, Federal Standard No. 595.

## **ITEM #1107011A – ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A)**

### **Description:**

Furnish and install an Accessible Pedestrian Signal and Detector (APS&D). The APS&D provides audio and tactile information to augment the visual pedestrian signal.

Type A provides a low frequency percussive tone during the walk interval and is used where there is an exclusive pedestrian phase or  $\geq 10$  foot separation between APS&Ds.

### **Material:**

#### **A. General:**

- Conform to applicable sections of the current MUTCD Chapter 4E, Pedestrian Control Features as specified herein.
- All features fully operational when the traffic signal is in colors mode.
- All features non-operational when the traffic signal is in flash mode.
- Interchangeable with a non-accessible type pedestrian pushbutton with no modifications to the Controller Assembly (CA) or Controller Unit.
- Audible transducer integral with the APS&D housing, adjacent to the pushbutton.
- Operation programming method: Either or combination of:
  - Mechanically by dip switches or circuit board jumpers
  - Infrared remote-control hand-held device

#### **B. Electrical:**

- Metallic components either grounded or insulated to preclude an electrical hazard to pedestrians under all weather conditions.
- All features powered by the 110VAC Walk signal and the 110VAC Don't Walk signal so that additional conductors from the CA are not needed.

#### **C. Audible Pushbutton Locator Tone**

- Frequency: repeating tone at one (1) second intervals
- Tone duration:  $\leq 0.15$  seconds
- Volume:
  - Minimum setting of zero
  - Manually adjustable initial setting
  - Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
  - Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
  - Automatic volume adjustment independent of other APS&Ds at the intersection.

- May be disabled without affecting operation of other features.
- Silent only during walk interval. Active all other times.

#### D. Vibrotactile Arrow Pushbutton

- Pushbutton contained in a circular assembly which fits inside the housing and is attached to the housing with 4 screws.
- Actuation of pushbutton acknowledged by confirmation light.
- Actuation of pushbutton initiates speech message “Wait”.
  
- ADA compliant: Size:  $\geq 2.0$ ” (50) diameter, Actuation force:  $\leq 5$  ft-lb (22.2 N)
- Shape: Circular, raised slightly above housing so that it may be actuated with the back of a hand
- Tamper-proof, vandal-proof, weatherproof, freeze-proof, impact-resistant design and construction.
- Operation: Vibrates only during the walk interval (when the walk indication is displayed).
- Tactile Arrow:
  - Attached to surface of the button assembly by a tamperproof method.
  - Raised slightly above surface of pushbutton, minimum 0.125” (0.3)
  - Size: Length  $\geq 1.5$ ” (38), Height  $\geq 1.0$ ” (25)
  - Color: Sharp contrast to background color of pushbutton and housing

#### E. Audible Walk Interval

##### 1. General:

- Operation independent of other APS&Ds at intersection.
- Active only during the walk interval (when the walk indication is displayed).
- Volume:
  - Minimum setting of zero
  - Manually adjustable initial setting
  - Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
  - Automatic volume adjustment independent of other APS&Ds at the intersection.
  - Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
- Duration:
  - Default method: Automatically set by the duration of the visual walk signal display.
  - When selected: Manually set when rest-in-walk is used for a concurrent pedestrian movement.
- Audible sounds that mimic any bird call are not allowed.



2. Type A, Percussive Tone:

- Repeating tone at eight (8) to ten (10) ticks per second.
- Tone frequency: Multiple frequencies with a dominant component at 880 Hz which creates a “tick - tick - tick...” sound.

F. Pushbutton Housing/Sign Frame/Sign

- One piece die cast aluminum meeting requirements of ASTM B85.
- Sign frame designed to accept 9" x 15" (230 x 380) four-hole advisory sign.
- Flat back to facilitate surface mount.
- Available brackets to either pedestal top-mount or pole side-mount on pole diameter range of 3½" (89) to 15" (380).
- Available brackets to allow mounting two (2) APS&Ds to the same 3½" (89) pole, facing  $\geq 60$  degrees apart, at the same height.
- Available extension bracket of a size indicated on the plan – 18" maximum.
- Wire entrance through the rear.
- Stainless steel mounting hardware.
- Color: The color shall be black No. 17038, Federal Standard No. 595. At intersections at Merritt Parkway interchanges, all brackets and hardware shall be painted dark green by the manufacturer. The color shall be No. 14056, Federal Standard No. 595.
- Finish: Housing/Frame and all mounting brackets either:
  1. Painted with 3 coats of infrared oven-baked paint before assembly.
    - Primer: Baked iron oxide which meets or exceeds FS TT-P-636.
    - Second coat: Exterior-baking enamel, light gray, which meets or exceeds FS TT-E-527.
    - Third coat: Exterior-baking enamel, which meets or exceeds FS TT-E-489.
  2. Electrostatic powder coated after chemically cleaned.
- Sign: CT DOT Sign No. 31-0856

**Construction Methods:**

Install the APS&D according to the manufacturer’s instructions. Position the APS&D so the plane of the sign face is parallel to the crossing (sign is facing perpendicular) and the arrow is pointing in the same direction as the crossing, not necessarily at the ramp. Notify the Engineer if there is any discrepancy or ambiguity between the plans and field conditions that prevent placement of the APS&D as shown on the plan. Set the minimum sound levels of the locator tone and the audible walk indication when there is little or no ambient noise as in night time operation. Set the volume of audible walk indications and pushbutton locator tones to a maximum of 5dBA louder than ambient sound. The locator tone should be audible 6’ to 12’ (1.8 m to 3.6 m) from the pushbutton or to the building line, whichever is less. Confirm the volume of both audible walk indication and the locator tone increases with an increase in ambient sound and subsequently decreases when the ambient noise decreases.

If programming method is remote, by an infrared hand-held device, provide one device and operation manual for each intersection where APS&D is installed.

**Method of Measurement:**

This work is measured by the number of APS&Ds of the type specified, installed, tested, fully operational, and accepted.

**Basis of Payment:**

Payment for this work is based on the installation, inspection, successful completion of the 30 day test period, and final acceptance of the Accessible Pedestrian Signal and Detector of the type specified. Payment includes the sign, mounting brackets for adjacent buttons on the same structure, extension brackets, all necessary cable, all incidental materials, labor, tools, and equipment necessary to complete the installation. Payment also includes the warrantee, installation manual, and operation manual.

If programming method is remote by an infrared hand-held device, the total bid price of all APS&Ds includes one remote programming device and accompanying operation manual for each intersection where APS&D is installed.

<u>Pay Item</u>	<u>Pay Unit</u>
Accessible Pedestrian Signal and Detector (Type A)	Each

25 - 6003-05-03-au2619-specs - 1107011a - accessible pedestrian signal and detector.doc

## **ITEM #1108118A – NEMA TS2, TYPE 2 TRAFFIC CONTROLLER AND CABINET**

**11.08.01 – Description:** This item shall consist of furnishing and installing an actuated controller, which shall be a completely digital solid state unit, for controlling the operation of the traffic signals.

The controller shall be completely furnished with the number of phases called for in the item. The cabinet to house the controller shall be completely wired and all sub-bases shall be complete with load switches and flash relays as specified. The cabinet shall also have all necessary auxiliary equipment required to provide the sequence and timing indicated on the plans.

**11.08.02 – Materials:** All materials furnished, assembled, fabricated, or installed shall be new, corrosion resistant, and in strict accordance with the latest provisions set forth by the City of New Britain Specifications. All equipment furnished under this item shall be current production equipment, compatible with the City of New Britain's existing traffic signal system.

1. Controller: The controller shall be Model Number "980 ATC TS2, Type 2 Controller with Ethernet & USB" as manufactured by Trafficware. The controller shall be ATC and NEMA TS2 standards based. The controller shall be capable of providing complex phasing, detector processing, coordination, communications, adaptive timing and systems operation as a master or secondary controller.

The Controller shall be equipped with LCD display and menu-driven software for programming and built-in diagnostics for evaluation of operational status. The controller shall have a flash memory which allows software upgrades without PROM replacement. The controller shall have a front panel mounted USB port to facilitate upgrades and file access. The controller shall be Ethernet-enabled to allow communication across a TCP/IP network.

2. Cabinet: Each controller assembly shall be completely wired and housed in a rigid metal cabinet with a painted color "CT Gray" finish. The cabinet shall be a NEMA P-44 Traffic Control Cabinet of clean-cut design and appearance and shall be substantially constructed of aluminum alloy. Door handle and hinges shall be stainless steel

The cabinet shall be base mounted with approximate dimensions of 54" high x 44" wide x 26" deep. The cabinet shall have a single front door with #2 Corbins lock. The cabinet door shall have an auxiliary door which shall be equipped with a lock and a police key. Two keys shall be furnished for each lock. When closed, all doors shall fit tightly to neoprene gasket material.

The cabinet ventilation shall include two intakes, exhausts, filtrations, two fans, and one thermostat assembly. Each electric fan shall be equipped with ball or roller bearings and

with a capacity of at least 100 cfm. The fans shall be mounted inside the front top of the cabinet ventilation holes. The fans shall be controlled by one manually adjustable thermostat.

One pullout drawer shall be provided mounted under the bottom shelf in the cabinet. The drawer shall be approx. 1” high x 13” deep x 16” wide and capable of holding 40 lbs in weight when the drawer is extended. This drawer shall have a flip up lid to place a laptop computer on top when extended while protecting any documentation in the drawer when the cabinet door is open.

3. Malfunction Management Unit: Malfunction Management Unit (MMU) shall be shelf-mountable, sixteen channel, LCD display, solid state Malfunction Management Unit. The MMU shall meet the following requirements:
  - a. No circuit cuts shall be allowed on circuit boards in any of the equipment supplied. Any wire jumpers included on circuit boards shall be placed in plated through holes that are specifically designed to contain them. Jumpers that are tack soldered to circuit traces or are added to correct board layout errors are not acceptable.
  - b. MMU shall have an Ethernet connector and shall be connected to the switch.
  - c. All IC’s with 16 or more pins shall be mounted in machine-tooled sockets. All sockets shall have two-piece, machined contacts and closed end construction to eliminate solder wicking. The outer sleeve shall be brass with tin or gold plating and tapered to allow easy IC insertion. The inner contact shall be beryllium copper sub plated with nickel and plated with gold. All sockets shall have thermoplastic bodies meeting UL Specification 94V-0. Other high quality sockets may be acceptable but must have prior approval of the Engineer. Sockets meeting alternate specifications shall be submitted in writing with the bids. Zero insertion force sockets will not be allowed.
  - d. The design shall allow for removal or replacement of a circuit board without unplugging or removing other circuit boards.
  - e. The unit shall be designed so that one side of each board can be completely accessible for troubleshooting and testing the unit while it is still operating. This may be accomplished with extender boards or cables. This need apply to only one circuit board at a time.
  - f. No more than two circuit boards shall be attached to each other to constitute a circuit assembly. Attaching hardware shall use captive nuts or other acceptable method to secure the boards together. Alternate methods shall be submitted in writing with the bids. The boards shall be designed so that the purchaser can test and operate the controller unit with the boards separated.

- g. If this specification is used to support the purchase of a complete controller assembly, the unused red circuits shall be connected to the AC Line in the controller cabinet.
- h. A RS232 port shall be accessible from the front panel of the MMU. The RS232 port shall be compatible with portable computer and/or a PDA device that provides the following information:
  - Programming Report
  - Analyzer Report
  - History Report
  - Clear Report Logs
  - Download Real-Time Clock

A RS232 Communication Cable shall be supplied to interface the MMU to the controller.

- i. Each Malfunction Monitoring Unit shall have a unique serial number that is permanently and neatly displayed on the face of the unit. If this serial number is not on the face of the unit, then an additional temporary label that is neatly printed or typed shall be affixed to the MMU. The MMU supplied must be the Enhanced model with RS232 communication or City approved equal. 1 MMU shall be provided.
4. Auxiliary Equipment: All other auxiliary equipment, flasher units, load switches, wiring, fittings, and other cabinet requirements shall conform to the current edition of the State of Connecticut, Department of Transportation Functional Specifications for Traffic Signal Control Equipment.

**11.08.03 – Construction Methods:** The controller, mounted in controller cabinet, shall be installed at the locations shown on the plans in the following manner:

The cabinet shall have the base casting attached to the foundation and leveled before the cabinet proper is bolted to the base. A mastic type compound meeting the requirements of ASTM C647 shall be used between the cabinet and the base casting to make the two units rain-tight.

**11.08.04 – Method of Measurement:** This work will be measured for payment by the number of controllers completed, operating, and accepted in place.

**11.08.05 – Basis of Payment:** This work will be paid for a the Contract unit price each for “NEMA TS2, Type 2 Traffic Controller and Cabinet”, which price shall include controller, controller cabinet, malfunction management unit, auxiliary equipment, wiring, miscellaneous fittings, paint and painting, and all materials, equipment, tools and labor incidental thereto.

Pay Item

Pay Unit

NEMA TS2, Type 2 Traffic Controller and Cabinet EA

**Article M.16.09 - Controllers:** Add the following sub-articles:

The Connecticut Department of Transportation Functional Specifications for Traffic Control Equipment, current edition governs the material for the Controller Assembly. The Functional Specifications are advertised biennial for vendors to provide equipment to the State on a low bid basis. All underlined text indicates an addition or revision to these specifications from the previous version. The Functional Specifications are available on the Departments website.

Supplemental specifications listed below, have been added for material and controller operations which the Department of Transportation does not include in the Functional Specifications for Traffic Control Equipment.

U.C.F. Time Switch Flash Command Procedure  
Time Clock/Time Base Installation Requirements  
24 Volt Relay                      Type A  
110 Volt Relay                      Type F  
   Type G

Time Delay Relay  
Non-Actuated Advance Green Phase  
Actuated Advance Green Phase  
Non-Actuated Clearance / Lag Green Phase  
Actuated Clearance / Lag Green Phase  
Flashing Stop Ahead Sign  
Max II Actuation By Pedestrian Call

### **UNIFORM CODE FLASH COMMAND PROCEDURE**

1. Activate the **MINIMUM RECALL** input to the controller to ensure cycling prior to transferring to flashing operation.
2. Omit all non-actuated and actuated artery advance phases.
3. Omit phases 1 & 5 of all quad sequences.
4. Activate the **STOP TIME** input to the controller, upon entering flash, to prevent cycling.
5. Transfer to flash at the end of the last side street all red condition (at the point the artery **ON** output becomes active).
6. Special technical notes on the intersection plan supercede the above requirements.

## TC/TBC INSTALLATION REQUIREMENTS

The following requirements are to be observed when engineering the installation of TC/TBC:

1. a. Circuit 1 shall be designated FLASH and be reserved for night flash command.  
b. Circuit 2 shall be designated MAX 2 and be reserved for Max 2 command.  
c. Circuit 3 shall be designated COORD and shall select coordinated operation of the intersection.  
d. Circuit 4 shall be the yield, and force off command to the controller.
2. All clock outputs shall be active to select the function specified. For example; If the TC/TBC were removed for repair, no inputs would be applied to the controller. The intersection will then operate non-coordinated, in Max 1. Programming the TC/TBC without cycle and offset is not an acceptable method to create a non-coordinated operation. Refer to the typical hookup diagram.
3. All TC/TBC clock installations shall be wired as detailed in figure 1. This method is used for both full and semi actuated operation.
4. Midnight resync shall occur at 12:00 AM.
5. A program card shall be completed indicating all input steps and settings. Four copies shall be provided. One copy left in the cabinet. Three delivered to the engineer along with the cabinet wiring diagrams.

### TIME CLOCK / TIME BASE COORDINATION

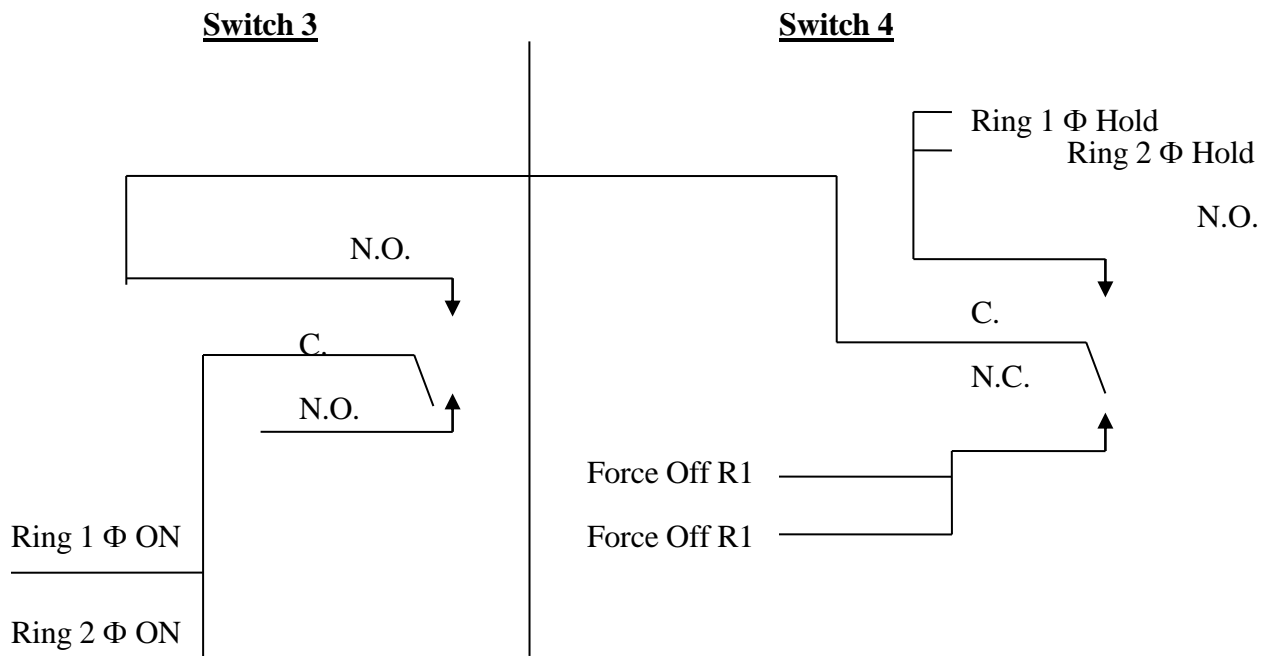


FIG. 1

## 24 VOLT RELAY

All 24 Volt relays shall meet the requirements of one of the following two types. Diodes shall be installed across the coils of all direct current relays to shunt the reverse voltage generated when the coil de-energizes. All diodes shall be general purpose ECG 125 1000prv @ 25A or equivalent, rated at least .5 amp forward biased. Diodes shall be external to the relay, not enclosed in the dust cover.

**TYPE A: Midland Ross, Midtex 155-92 or equivalent.**

### **DESCRIPTION:**

This relay shall be enclosed in a clear polycarbonate removable dust cover. It shall have a mechanical life of more than 100,000 operations at rated load.

### **CONTACTS:**

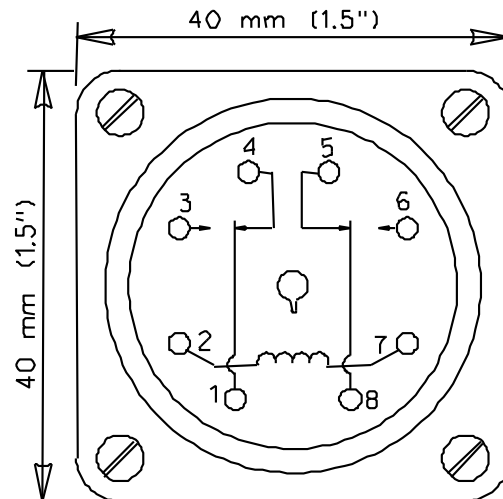
The contacts shall be 2 form C (D.P.D.T), U.L. rated at 5 amps 120 volts A.C. The contacts shall be pure fine silver (gold flash). There shall be no tungsten (lamp) load on the contacts of this relay.

**COIL:** The coil shall operate on 24 V.D.C. and have no less than 450 OHMS impedance.

**SIZE:** The relay shall be no larger than 65mm(2.5") H x 40mm(1.5") L x 40mm(1.5") W.

**BASE:** This relay shall have an eight pin octal plug-in base with the pin designation shown below:

1. Common (1)
2. Coil
3. Normally open (1)
4. Normally closed (1)
5. N.C. (2)
6. N.O. (2)
7. Coil (2)
8. Comm.



Bottom View And Wiring Diagram

**SOCKET:** The socket shall be a closed back, screw terminal type. The front mounted screws shall be 6-32 capable of accepting #14 AWG wire.



## 110 VOLT RELAY

All 110 volt relays shall meet the requirements of one of the following two types. Across the coil of each relay there shall be a molded suppressor rated at .1uf - 47 ohm @ 600V to suppress electrical noise created by the energization / de-energization of the relay.

**TYPE F:** Midland Ross, Midtex 136-62T3A1 or equivalent

### **DESCRIPTION:**

Relays of this type shall function as flash transfer, power switching and signal drive. Other uses are acceptable, however, type G relays cannot be used for the above applications.

### **CONTACTS:**

The contacts shall be in the D.P.D.T. form and consist of 10mm(3/8") diameter silver cadmium oxide, rated at 20 Amps @ 117 VAC resistive.

### **COIL:**

The coil shall operate on 110 VAC. No semi-conductors will be allowed in the coil circuit of this relay.

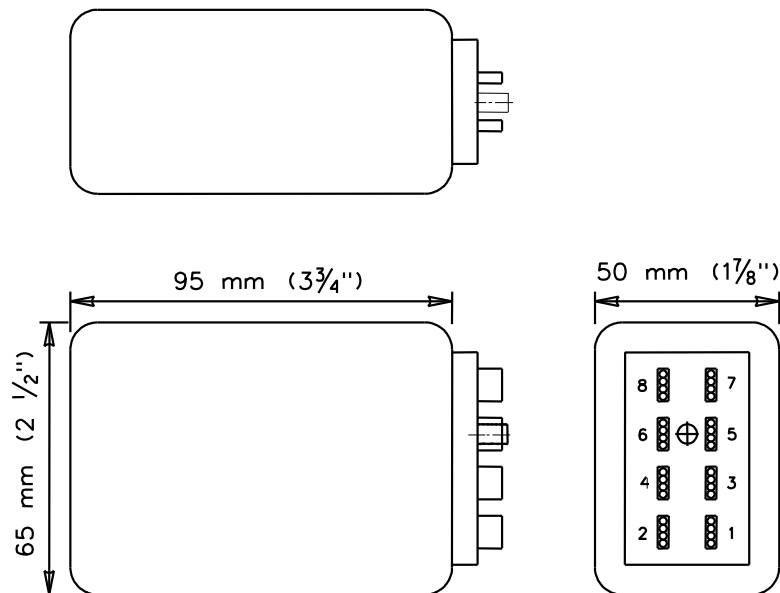
### **SIZE:**

The relay shall be enclosed in a clear plastic dust cover. The overall dimensions shall be no larger than 63mm(2 1/2") x 94mm(3 3/4") x 47mm(1 7/8") as illustrated below.

### **BASE:**

This relay shall have an eight blade plug-in base, Ventron Beau Plug P-5408 or equivalent with the pin designations as shown below:

1. Coil
2. Coil
3. N.C. 1
4. N.C. 2
5. Comm. 1
6. Comm. 2
7. N.O. 1
8. N.O. 2



### **SOCKET:**

The socket shall be Ventron Beau Plug S-5408 or equivalent, contacts rated at 15 Amps @ 1750 VRMS.

**TYPE G:** Magnecraft, W 88 ACXP-8 or equivalent

**DESCRIPTION:**

Relays of this type shall function in low current switching applications such as interconnect interface or pre-emption circuits. A clear polycarbonate plastic enclosure shall cover the relay mechanism.

**CONTACTS:**

The contacts shall be in the D.P.D.T. form and consist of 5mm (3/16") diameter gold flashed, silver alloy, rated at 10 Amps @ 120 VAC resistive.

**COIL:**

The coil shall operate on 120 Volts AC and require a nominal 3 VA.

**SIZE:**

Height, length and width dimensions shall be the same as the 24 volt relay Type A: 35mm (1 3/8") x 60mm (2 3/8") x 35mm (1 3/8").

**BASE:**

The base shall be an octal plug with the pin designations the same as the 24 volt relay Type A.

**SOCKET:**

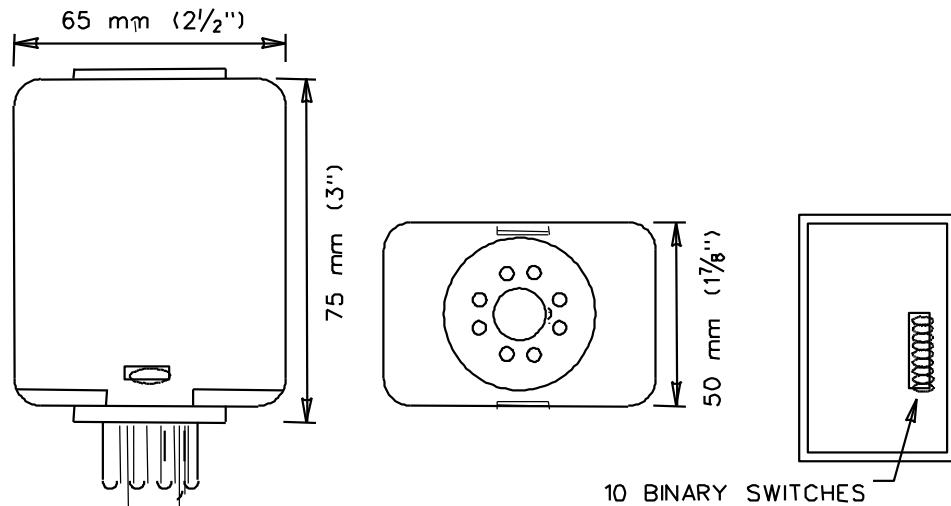
The socket shall be the same as that for the 24 volt relay Type A.

### TIME DELAY RELAY

120 VAC      SSAC TDM120A or equivalent  
24 VDC      SSAC TDM24DL or equivalent

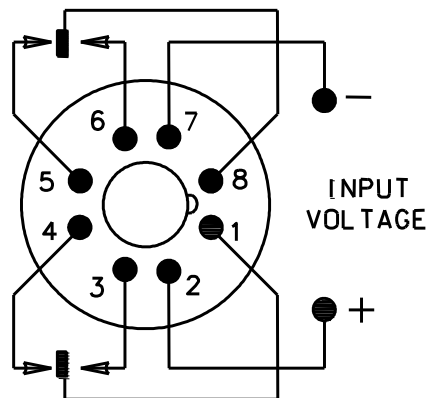
#### **DESCRIPTION:**

The time delay relays shall be self enclosed, plug-in, delay on operate type. They shall be digitally timed and adjustable by the use of dip switches located on the top of the case. The timing range shall be 1 to 1023 seconds in 1 second intervals. The time delay relays shall have an internal double pole double throw relay with form "C" contacts rated at 10 amps 120 volts AC. They shall operate accurately in a temperature range of -20 to +65 degrees C. A 120 volt AC input shall initiate timing of the 120 VAC TDR and a 24 VDC input shall initiate timing of the 24 VDC TDR. Removal of the input voltage shall reset the timer. Maximum dimensions of the case shall be as shown below.



#### **SOCKET:**

The socket shall be a standard octal base (8 pin) with screw terminal connectors. The pin designation shall be as shown below.



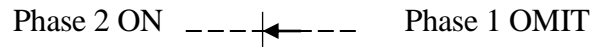
OCTAL (8 PIN) BASE

### NON-ACTUATED ADVANCE GREEN PHASE

Where the timing and sequence indicates an advance green phase that always precedes the phase in recall (usually phase 2), and that either is fixed timed or is to be extended only, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to the advance phase OMIT input.
2. If the advance phase is to be extendable, it shall be in minimum recall. If the advance phase is fixed timed, it shall be in maximum recall. A different advance time may be selected by switching to maximum 2.

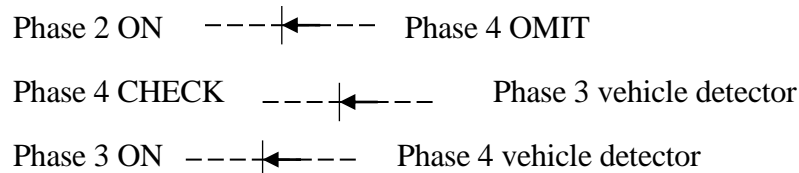
Example: Phase 1 is the advance phase (extendable), in minimum recall.  
Phase 2 is the artery, in recall.  
Phase 4 is the minor street, in non-lock.



Where the timing and sequence indicates an advance phase that is fixed timed (not extendable), and that always precedes either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

1. The recall phase (usually Phase 2) ON output shall be diode connected to the advance phase's, parent phase OMIT input.
2. The parent phase CHECK output shall be diode connected to the advance phase vehicle detector input.
3. The advance phase ON output shall be diode connected to the following parent phase vehicle detector input. This is to insure a green indication on the parent phase.
4. The advance phase shall be in the non-lock mode. The advance time shall be selected from the maximum interval.

Example: Phase 2 is the artery, in recall.  
Phase 3 is the advance for phase 4, in non-lock mode.  
Phase 4 (parent phase) is the minor street, in non-lock mode.

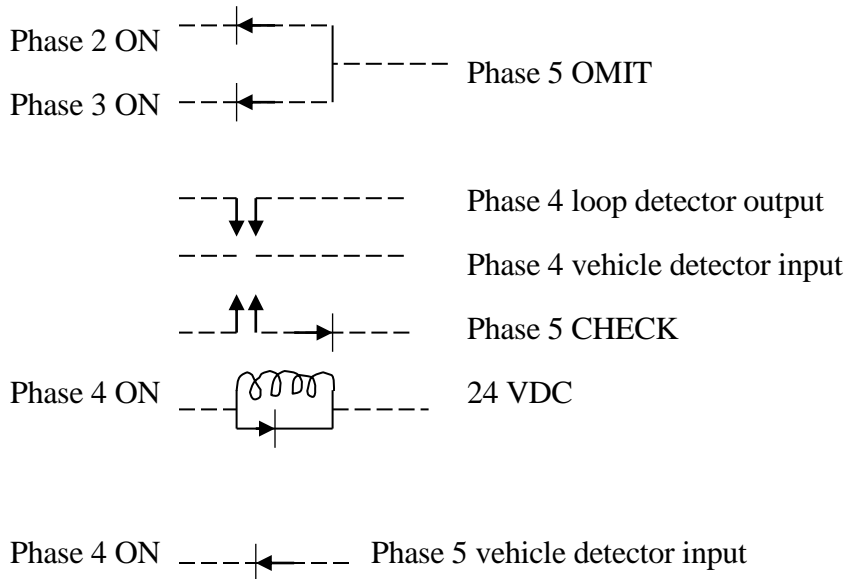


**ACTUATED ADVANCE GREEN**

Where the timing and sequence indicates an advance green phase that is to be extended only, and is to always precede either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

1. The phase ON outputs of all phases that could precede the advance phase, shall be diode connected to the parent phase OMIT input.
2. The parent phase CHECK output shall be diode connected, through the normally closed contacts of a relay, to the advance phase vehicle detector input. The advance phase loop detector output shall be connected to the normally open contacts.
3. The relay coil shall be energized by the advance phase ON output, which in turn will switch the vehicle detector input from the parent phase CHECK circuit to the loop detector.
4. The advance phase ON output shall be diode connected to the following parent phase vehicle detector input. This is to insure a green indication from the parent phase.
5. The advance phase shall be in the non-lock mode.

Example: Phase 2 is the artery, in recall.  
Phase 3 is the pedestrian phase.  
Phase 4 is the advance for phase 5, in non-lock.  
Phase 5 (parent phase) is the minor street, in non-lock.



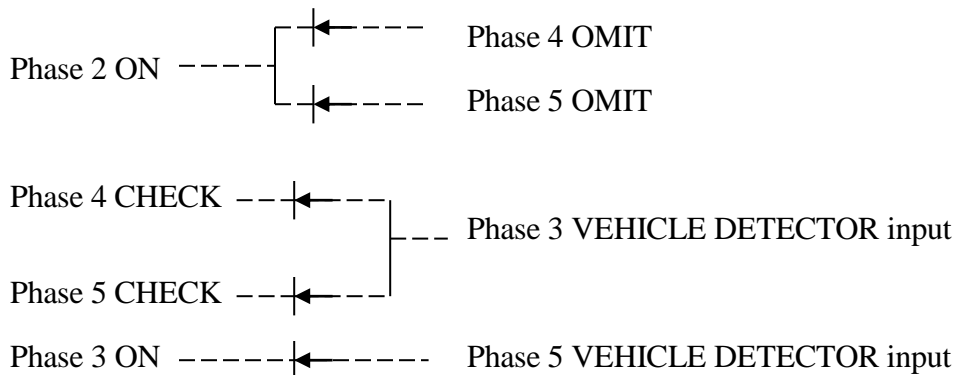
The 24 volt relay shall be Type C as previously described in these specifications.

**NON-ACTUATED CLEARANCE PHASE**  
**NON-ACTUATED LAG GREEN PHASE**

Where the timing and sequence indicates a non-actuated clearance phase or a lagging green phase that always follows the phase in recall, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to all appropriate phase OMIT inputs except the clearance phase.
2. The remaining actuated phases shall have their CHECK outputs diode connected to the clearance phase vehicle detector input.
3. The clearance phase ON output shall be diode connected to the following phases vehicle detector input (if the phase is in non-lock mode). This will prevent the controller from returning to the parent phase from the clearance phase without servicing the minor street.
4. The clearance phase shall be in the non-lock mode.
5. The clearance, or lag green time shall be selected from the maximum interval.

Example: Phase 2 is the artery, in recall.  
Phase 3 is the clearance phase, in non-lock.  
Phase 4 is the pedestrian phase.  
Phase 5 is the minor street, in non-lock.



Where the timing and sequence shows a non-actuated clearance phase or lagging green phase following either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to the following clearance phase vehicle detector input. This insures the clearance phase will always follow the parent phase.
2. The clearance phase shall be in the non-lock mode.
3. The clearance, or lag green time shall be selected from the minimum green interval.

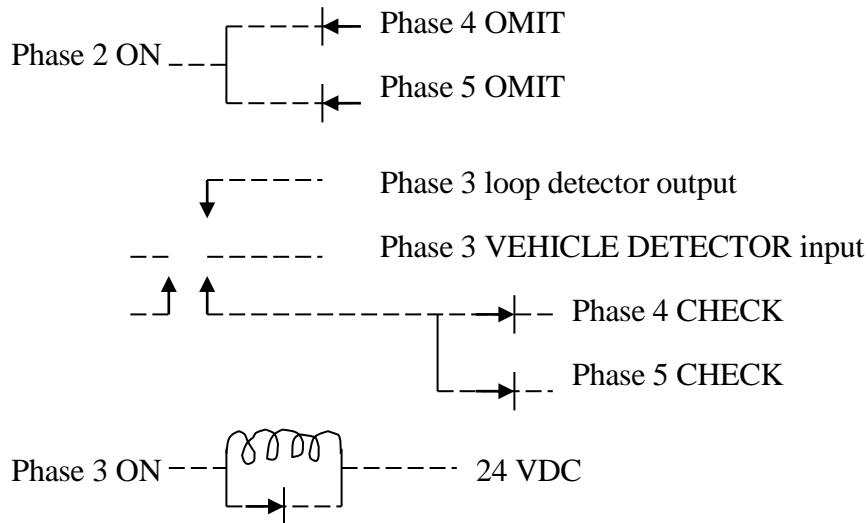
Parent phase ON ---|<--- Clearance phase VEHICLE DETECTOR input

**ACTUATED CLEARANCE PHASE**  
**ACTUATED LAG GREEN PHASE**

Where the timing and sequence indicates an actuated lagging green phase that is to be extended only, and always follows another phase, the following guidelines shall be in effect:

1. The parent phase (usually phase 2) ON output shall be diode connected to the phase OMIT inputs of all phases that could follow the lag phase.
2. The CHECK outputs of all phases that could follow the lag phase shall be diode connected, through the normally closed contacts of a relay, to the lag phase vehicle detector input. The lag phase loop detector output shall be connected to the normally open contacts.
3. The relay coil shall be energized by the lag phase ON output which in turn will switch the phase detector input from the CHECK circuits to the loop detector.
4. The lag phase shall be in the non-lock mode.

Example: Phase 2 (parent phase) is the artery, in recall.  
Phase 3 is the lag phase, in non-lock.  
Phase 4 is the pedestrian phase.  
Phase 5 is the minor street, in non-lock.



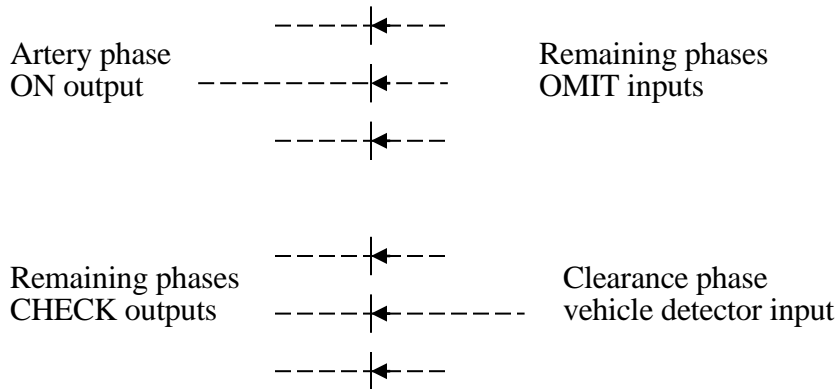
The 24 VDC relay shall be Type C as previously described in these specifications.

### FLASHING STOP AHEAD SIGN

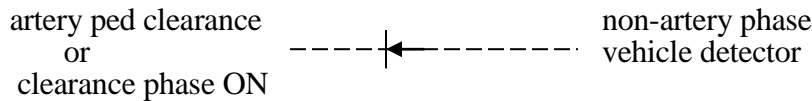
Where the timing and sequence indicates a flashing stop ahead sign, the clearance interval following the phase that the sign is off shall be timed by the following method.

The following phase shall be used for the clearance time. These phases shall be overlapped. The green indication will be maintained by the overlap feature and the following phase green time will be the stop ahead sign clearance.

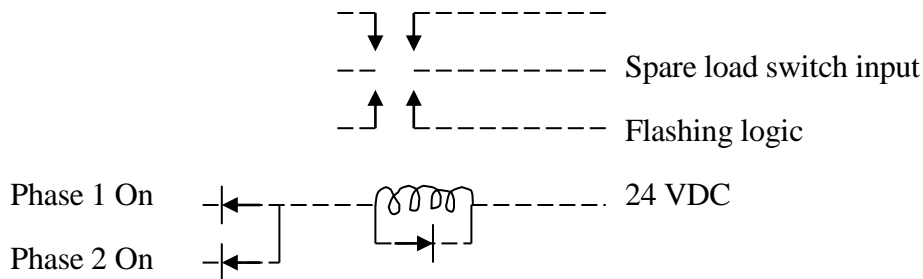
The artery phase ON output shall be diode connected to all other phase OMIT inputs except the clearance phase and the artery phase. The CHECK outputs from the remaining phases (as needed) shall be diode connected to the sign clearance phase vehicle detector input. The clearance phase shall be in the non-lock mode.



If the non-artery phases are in the non-lock mode, a call must be forced to the non-artery phase once the controller leaves the artery Hold interval (either artery walk or artery green). This prevents a false "Stop Ahead" indication if a vehicle turns right on red during the flashing sign clearance interval.



Unless otherwise shown on the plans, the 110 VAC flash power shall be from a spare load switch in the controller cabinet. The load switch input shall be driven with the flashing logic output from the controller. The flashing logic output shall be disconnected from the load switch during the intervals the sign is inactive.



Typical drive circuit for "WHEN FLASHING STOP AHEAD" sign



**TIME BASE COORDINATION**  
**MAX II ACTUATION BY PEDESTRIAN CALL**

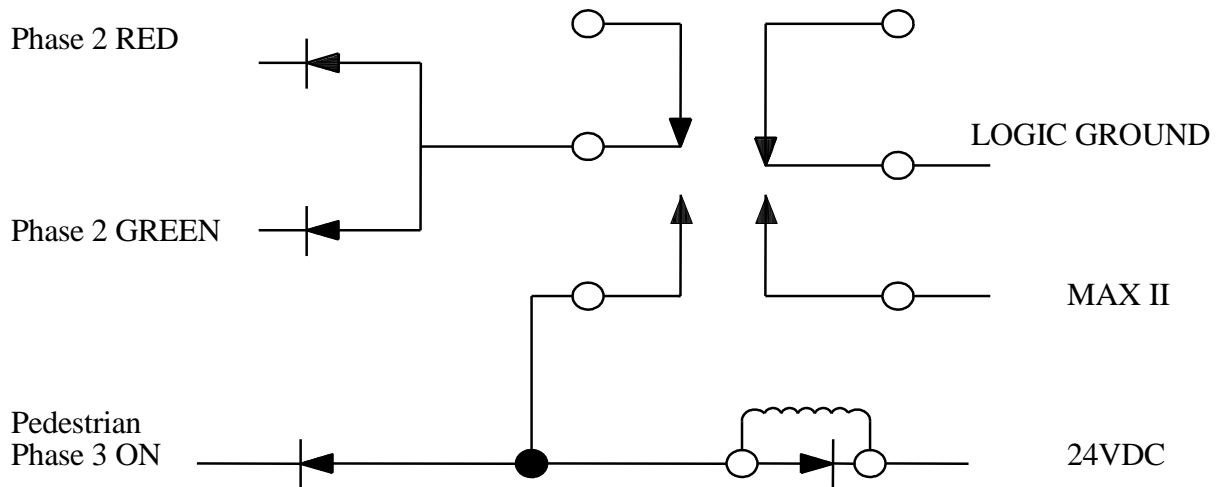
When the sum of the split times, including the walk and don't walk, exceed the background cycle length, the designer may choose to either allow a double cycle of the background timer or reduce the phase timings when the ped phase is called. Reduction of the phase timing by switching to MAX 2 avoids double cycling.

Where indicated on the plans the exclusive pedestrian phase will call MAX II. The minor movement max 2 times are set low so that the total phase times do not exceed the coordination cycle length.

Install a 24 volt relay connected to the inputs and outputs as shown on the following schematic.

Operation: When the controller advances to the exclusive pedestrian phase, the relay is actuated and latched. MAX II timing is selected for one complete cycle, until the relay is unlatched by the artery yellow (absence of red or green).

Example: Phase 2 is the artery. Phase 3 is the exclusive pedestrian phase.



26 - 6003-05-03-au2619-specs - 1108118a - new britain controller.doc

**ITEM #1108726A – CONFIRMATION LIGHT (TOWN SIGNALS ONLY)**  
**ITEM #1108727A – PHASE SELECTOR (AUDIO)**  
**ITEM #1112207A – SIREN DETECTOR**

**System Description:**

The emergency vehicle priority system shall enable an emergency vehicle to remotely cause the traffic signal controller to advance to and/or hold a desired traffic signal phase.

The system shall consist of the following components:

Siren Detector  
Phase Selector (Audio)  
Confirmation Light (optional)

**Material:**

All system components shall meet or exceed NEMA TS1 and TS2 environmental specifications.

**Siren Detector**

The acoustical siren detector (SD) shall be a lightweight, weatherproof, highly directional microphone capable of sensing and transforming audible siren sound energy into electrical signals useable by the phase selector. The unit shall include a single 45-ohm microphone, which provides high directional discrimination. Microphone mounting hardware shall allow for full 360-degree alignment on a traffic standard, mast arm, pedestal, wood pole or span wire application. The microphone shall be responsive to a siren that produces a nominal sound pressure level of 120-db spell at a 10-foot distance from the vehicle.

1. The siren detector shall be capable of recognizing three different and distinct types of signals: Yelp, Wail and Hi-Lo.
2. Shall operate over an ambient temperature range of minus 40<sup>o</sup>C to plus 85<sup>o</sup>C. (minus 40<sup>o</sup>F. to plus 185<sup>o</sup>F.)
3. Shall have internal circuitry potted in a semi-flexible compound to ensure moisture resistance.
4. Shall operate in 0 to 95 % humidity.
5. Shall have a cone of detection of not more than 13 degrees. The detector shall not sense a pre-emption signal from a siren outside this cone.

## **Phase Selector (AUDIO)**

The Phase Selector (PS) supplies power to and receives electrical signals from the siren detector.

The PS shall be capable of assigning priority traffic movement to one of two channels on a first-come, first-serve basis. Each channel is connected to the appropriate pre-emption input of the traffic controller. Once a call is recognized, "commit to green" circuitry in the PS functions so that the desired pre-emption call will be obtained even if siren communication is lost. After serving a priority traffic demand, the PS unit will release the controller to follow normal sequence operation.

The PS shall consist of a standard 4.500" x 6.875" three-slot stand-alone card rack with a signal processor card and a microphone interface card. The signal processor shall have switches for manual pre-emption and an RS-232 port for communications via a laptop computer. The third slot shall accept an optional Confirmation Light driver card when specified. When not specified the slot shall have a cover to prevent dirt, moisture etc. from entering the card rack. All input and output signals shall be interfaced from the chassis rear via 44 contact backplane connectors.

1. Shall include an internal power supply to supply power to the SD.
2. Shall have minimum two-channel operation with the capability of interfacing with an additional phase selector for expansion of channels of operation.
3. Shall have adjustable detector range controls for each channel of operation, from 12M (40 feet) to 548M (1800 feet).
4. Shall have solid state indicator lights for power on and channel called.
5. Shall operate over an ambient temperature range of minus 34<sup>0</sup> C to plus 60<sup>0</sup> C (minus 30<sup>0</sup> F. to plus 140<sup>0</sup> F.)
6. Shall operate in 0 to 95 % humidity.

## **Confirmation Lights (OPTIONAL—ONLY ON TOWN/CITY OWNED SIGNALS)**

When indicated on the plan a Confirmation Light (CL) with drive card shall be installed. The CL shall provide visual indication to the emergency vehicle operator that the siren has been detected and that the pre-emption call has been sent to the traffic signal controller. **CL is not permitted on State owned signals.**

The CL unit:

- 1) Shall be a 110 VAC white incandescent lamp designed for outdoor application.
- 2) Mounting hardware shall be corrosion resistant, designed for outdoor installation.

- 3) Shall be capable of displaying a flashing or solid output during pre-emption call.
- 4) The driver card shall be programmable with dipswitches.

### **System Operation:**

- A. The pre-emption sequence shall be initiated when the directional SD receives the required acoustical signal from the EV siren. The SD converts the siren's acoustical signal into an electrical signal that is sent to the PS.
- B. The PS produces a ground-true output that is connected to the appropriate traffic controller pre-emption input.
- C. The traffic controller begins the pre-emption run as shown on the plan and as programmed in the controller.
- D. A SD facing away from the approaching EV shall sense the change in siren audible level when the EV passes through the intersection. The PS shall then terminate the pre-emption call within 10 seconds. If the EV does not pass through the intersection or if the siren is turned off, the PS shall automatically terminate the pre-emption call after 45 seconds.
- E. The PS shall not respond to acoustical signals from an EV if it is already processing acoustical signals from another emergency vehicle.

### **System Interface:**

System shall be capable of operating in a computerized traffic management system when the computer supplier provides appropriate interfacing.

### **Construction Methods:**

#### **General:**

The Contractor shall furnish the manufacturer the phasing diagrams indicating controller sequence and timing and proposed SD locations. Detector and CL locations shown on the plan are for illustration purposes only. The manufacturer or his designated representative shall be responsible for final location of SD's and CL's; determining and setting the optimal range for the emergency vehicle pre-emption system; conducting system test.

The Contractor shall secure from the manufacturer a guarantee for the equipment for a period of sixty (60) months, which time shall commence from the date of delivery. Manufacturer shall certify upon request that all materials furnished will conform to this specification.

All equipment shall be installed and wired in a neat and orderly manner in conformance with the manufacturers' instructions.

Traffic signals owned and maintained by the State that have pre-emption equipment owned and maintained by the town shall have an Auxiliary Equipment Cabinet (AEC) attached to the controller cabinet. The pre-emption equipment shall be housed in the AEC. Traffic signals owned and maintained by the town do not require an AEC to house the pre-emption equipment.

Detector cables shall be continuous with no splices between the siren detector and the AEC.

If not present in an existing traffic controller cabinet, the following items shall be installed and connected, in conformance with the current Functional Specifications for Traffic Control Equipment, "D" Cabinet Requirements (Pre-emption Type):

- Controller "D" harness and adapter.
- Pre-emption termination panel with terminal block and relay bases.
- Pre-emption disconnect switch, mounted on the emergency switch panel (on inside of cabinet door).
- Pre-emption test buttons, mounted on the pre-emption termination panel.

All connections from the phase selector to the "D" harness and to the cabinet wiring shall be made at the termination panel. The termination panel shall have AC+ Lights, AC-, and a switched logic ground. The switched logic ground feeds all the pre-empt inputs to the controller unit. When switched off by the pre-emption disconnect switch, the traffic controller shall not be affected by pre-empt calls from the pre-emption system. A minimum of two test buttons shall be provided. If there are more than two pre-empt runs, a button for each shall be installed. Program the traffic controller to the pre-emption runs as shown on the plans. A chart or print out indicating the program steps and settings shall be provided along with the revised cabinet wiring diagrams.

#### **Pre-emption System Test:**

1. Notify the system owner/user, such as the municipal fire chief or public works director, of the scheduled inspection.
2. Request a fire department representative and an emergency vehicle, which has a siren to conduct the test. If not available, the contractor shall provide a siren.
3. In the presence of the Engineer and the municipal representative, test each pre-empted approach with the emergency vehicle. Test the following items of the system:

\*Confirm that the siren activates the phase selector and the PS activates the correct pre-emption input to the controller.

\*Confirm adequate range. The traffic signal must be pre-empted to green sufficiently in advance of the emergency vehicle arrival. The vehicle siren shall initiate pre-emption at a minimum distance of 548.6M (1800 feet).

\*Confirm there are no false calls. Keep the siren active as the emergency vehicle passes through the intersection. No other detectors shall initiate a pre-emption run and the pre-emption call shall terminate after 10 seconds.

4. Document the test. Provide the Engineer and, upon request, the municipality copies of the test results.

If a malfunction is found or the system needs adjustment (such as range, siren intensity, or detector location), schedule a follow-up test. Repeat the above steps for all approaches that did not pass.

#### **Method of Measurement:**

Detectors, Phase Selector and Verification Lights will be measured for payment by the number of each supplied, installed and accepted.

#### **Basis of Payment:**

Payment for Siren Detectors and Verification Lights will include the item unit cost, including all manufacturer's required mounting hardware and the cost of installation and supervision by the manufacturer or his designated representative, including travel and subsistence, and all materials, equipment and labor incidental thereto. Payment for the CL shall also include the drive card. Payment for Phase Selector (Audio) will include the card rack with signal processor card and microphone interface card, operation manual, parts list and warrantee. When needed, payment for the phase selector shall also include the termination panel, "D" harness, test buttons, program chart (or print out) and revised cabinet wiring diagrams.

<u>Pay Items</u>	<u>Pay Units</u>
Confirmation Light	Ea.
Phase Selector	Ea.
Siren Detector	Ea.

27 - 6003-05-03-au2619-specs - 11xxxxx phase selector and siren detector.doc

- ITEM #1111201A – TEMPORARY DETECTION (SITE NO. 1)**
- ITEM #1111202A – TEMPORARY DETECTION (SITE NO. 2)**
- ITEM #1111203A – TEMPORARY DETECTION (SITE NO. 3)**
- ITEM #1111204A – TEMPORARY DETECTION (SITE NO. 4)**
- ITEM #1111205A – TEMPORARY DETECTION (SITE NO. 5)**
- ITEM #1111206A – TEMPORARY DETECTION (SITE NO. 6)**
- ITEM #1111207A – TEMPORARY DETECTION (SITE NO. 7)**
- ITEM #1111208A – TEMPORARY DETECTION (SITE NO. 8)**
- ITEM #1111209A – TEMPORARY DETECTION (SITE NO. 9)**
- ITEM #1111210A – TEMPORARY DETECTION (SITE NO. 10)**
- ITEM #1111211A – TEMPORARY DETECTION (SITE NO. 11)**
- ITEM #1111212A – TEMPORARY DETECTION (SITE NO. 12)**
- ITEM #1111213A – TEMPORARY DETECTION (SITE NO. 13)**
- ITEM #1111214A – TEMPORARY DETECTION (SITE NO. 14)**
- ITEM #1111215A – TEMPORARY DETECTION (SITE NO. 15)**
- ITEM #1111216A – TEMPORARY DETECTION (SITE NO. 16)**
- ITEM #1111217A – TEMPORARY DETECTION (SITE NO. 17)**
- ITEM #1111218A – TEMPORARY DETECTION (SITE NO. 18)**

**Description:**

Provide a Temporary Detection (TD) system at signalized intersections throughout the duration of construction, as noted on the contract plans or directed by the Engineer. TD is intended to provide an efficient traffic-responsive operation which will reduce unused time for motorists travelling through the intersection. A TD system shall consist of all material, such as pedestrian pushbutton, accessible pedestrian signal, conduit, handholes, cable, messenger, sawcut, loop amplifier, microwave detector, Video Image Detection System (VIDS), Self-Powered Vehicle Detector (SPVD), and any additional components needed to achieve an actuated traffic signal operation.

**Materials:**

Material used for TD is either owned by the Contractor and in good working condition, or existing material that will be removed upon completion of the contract. Approval by the Engineer is needed prior to using existing material that will be incorporated into the permanent installation. New material that will become part of the permanent installation is not included or paid for under TD.

**Construction Methods:**

The work for this item includes furnishing, installation, relocating, realigning, and maintaining the necessary detection systems as to provide vehicle and pedestrian detection during each phase of construction. If not shown on the plan, program the TD modes (pulse or presence) as the existing detectors or as directed by the Engineer. If the TD method is not specified elsewhere in the Contract, (loops, SPVD, microwave, VIDS, pushbutton, or other) it may be the Contractor’s choice. The method chosen for TD must be indicated on the TD Plan submission.

The traffic signal plan-of-record, if not in the controller cabinet will be provided upon request. Ensure the controller phase mode (recall, lock, non-lock) and phase timing are correct for the TD. Adjust these settings as needed or as directed by the Engineer.

At least 30 days prior to implementation of each phase of construction submit a TD proposal to the Engineer for approval. Submit the TD proposal at the same time as the Temporary Signalization plan. Indicate the following information for each intersection approach:

- Phase Mode
- Temporary Detection Method
- Area of Detection
- Detector Mode

Submit the proposed temporary phase timing settings and the TD installation schedule with the TD proposal. See the example below.

Example Proposed Temporary Detection and Timing

**Site 1**

Warren, Rt. 45 at Rt. 341, Location #149-201

Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
<i>Rt. 45 NB</i>	<i>2</i>	<i>Min Recall</i>	<i>VIDS</i>	<i>150' from Stop Bar</i>	<i>Presence</i>
<i>Rt. 45 SB</i>	<i>2</i>	<i>Min Recall</i>	<i>SPVD</i>	<i>150' from Stop Bar</i>	<i>Pulse</i>
<i>Rt. 341</i>	<i>4</i>	<i>Lock</i>	<i>Microwave</i>	<i>30' from Stop Bar</i>	<i>Pulse</i>
<i>Rt. 341</i>	<i>4</i>	<i>Lock</i>	<i>Pushbutton</i>	<i>At SE &amp; SW corners</i>	<i>n/a</i>

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
<i>2</i>	<i>20</i>	<i>0</i>	<i>0</i>	<i>6</i>	<i>45</i>	<i>60</i>	<i>4</i>	<i>1</i>
<i>4</i>	<i>14</i>	<i>7</i>	<i>9</i>	<i>3</i>	<i>27</i>	<i>35</i>	<i>3</i>	<i>1</i>

Scheduled TD: *July 4, 2017* **Site 2**

Scotland, Rt. 14 at Rt. 97, Location #123-201



Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
<i>Rt. 15 WB Left Turn</i>	<i>1</i>	<i>Non-Lock</i>	<i>VIDS</i>	<i>5' in front to 10' Behind Stop Bar</i>	<i>Presence</i>
<i>Rt. 14 EB</i>	<i>2</i>	<i>Min Recall</i>	<i>Existing Loop</i>	<i>150' from Stop Bar</i>	<i>Pulse</i>
<i>Ped Phase</i>	<i>3</i>	<i>Non-Lock</i>	<i>Pushbutton</i>	<i>At all corners</i>	<i>n/a</i>
<i>Rt. 14 WB</i>	<i>6</i>	<i>Min Recall</i>	<i>VIDS</i>	<i>150' from Stop Bar</i>	<i>Presence</i>
<i>Rt. 97</i>	<i>4</i>	<i>Lock</i>	<i>Loop, Pre- formed</i>	<i>20' from Stop Bar</i>	<i>Pulse</i>

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
<i>1</i>	<i>5</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>12</i>	<i>18</i>	<i>3</i>	<i>1</i>
<i>2 &amp; 6</i>	<i>24</i>	<i>0</i>	<i>4</i>	<i>4</i>	<i>26</i>	<i>36</i>	<i>4</i>	<i>1</i>
<i>3</i>	<i>16</i>	<i>7</i>	<i>9</i>	<i>0</i>	<i>16</i>	<i>16</i>	<i>4</i>	<i>1</i>
<i>4</i>	<i>14</i>	<i>7</i>	<i>9</i>	<i>3</i>	<i>27</i>	<i>35</i>	<i>3</i>	<i>1</i>

Scheduled TD: *July 4, 2011*

When at any time during construction the existing vehicle or pushbutton detection becomes damaged, removed, or disconnected, install TD to actuate the affected approaches. Install and make TD operational prior to removing existing detection. TD must be operational throughout all construction phases.

Provide a list of telephone numbers of personnel who will be responsible for the TD to the Engineer. If the TD malfunctions or is damaged, notify the Engineer and place the associated phase on max recall. Respond to TD malfunctions by having a qualified representative at the site within three (3) hours. Restore detection to the condition prior to the malfunction within twenty-four (24) hours.

If the Engineer determines that the nature of a malfunction requires immediate attention and the Contractor does not respond within three (3) hours following the initial contact, then an alternative maintenance service will be called to restore TD. Expenses incurred by the State for alternative service will be deducted from monies due to the Contractor with a minimum deduction of \$500.00 for each service call. The alternate maintenance service may be the traffic signal owner or another qualified Contractor.

TD shall be terminated when the detection is no longer required. This may be either when the temporary signal is taken out of service or when the permanent detectors are in place and fully operational.

Any material and equipment supplied by the Contractor specifically for TD shall remain the Contractor's property. Existing material not designated as scrap or salvage shall become the

property of the Contractor. Return and deliver to the owner all existing equipment used as TD that is removed and designated as salvage.

**Method of Measurement:**

Temporary Signalization (TS) shall be measured for payment as follows:

Fifty percent (50%) will be paid when Temporary Detection is initially set up, approved, and becomes fully operational.

Fifty percent (50%) will be paid when Temporary Detection terminates and all temporary equipment is removed to the satisfaction of the Engineer.

**Basis of Payment:**

This work will be paid at the contract Lump Sum price for “Temporary Detection (Site No.)”. The price includes furnishing, installing, relocating, realigning, maintaining, and removing, the necessary detection systems and all incidental material, labor, tools, and equipment. This price also includes any detector mode setting changes, timing or program modifications to the controller that are associated with TD. All Contractor supplied material that will remain the Contractor’s property will be included in the contract Lump Sum price for “Temporary Detection (Site No.)”. Any items installed for TD that will become part of the permanent installation will not be paid for under this item but are paid for under the bid item for that work.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Detection (Site No.)	L. S.

**ITEM #1111600A – EXTENSION BRACKET**  
**ITEM #1112286A – 360 DEGREE CAMERA ASSEMBLY**  
**ITEM #1112289A – 360 DEGREE CLOSED LOOP SYSTEM VIDEO**  
**DETECTION PROCESSOR**  
**ITEM #1113725A – 23 AWG 4 TWISTED PAIR CATEGORY 6 CABLE**

**Description:**

Furnish and install a 360 Degree Video Image Detection System (360VIDS) as shown on the plans or as directed by the Engineer. The 360VIDS consists of a 360 Degree Camera Assembly (360CA), 360 Degree Closed Loop System Video Detection Processor (360CLSVDP), and 23 AWG 4 Twisted Pair Category 6 Cable. The Extension Bracket will be included on a case-by-case basis.

**Materials:**

All hardware shall be new, corrosion resistant. All equipment shall be current production.

360 Degree Camera Assembly: The Camera Assembly shall be the GridSmart 5MP 360 degree Bell Camera and conform to the following requirements:

Camera:

- No-aim, no-focus camera
- Downward facing lens and camera shroud
- Single Power Over Ethernet (POE) connection for power and data collection.
- Color image camera with 360 degree point of view (POV)
- Active picture elements (pixels): 2560 (H) x 1920 (V), minimum.
- Signal to noise ratio : 55dB
- Heated camera
- IP addressable

Camera Enclosure:

- Tamper proof constructed of painted or powder coated aluminum of at least 0.25 inch (6.35-mm) thickness.
- IP66-rated camera housing.

Camera Mounting Hardware:

- Swivel bracket for dual plane adjustment for leveling
- Quick connect junction box
- Hybrid terminal junction box with surge.
- Astro-Brac banded bracket

- 34 inch to 78 inch 90 degree mounting arm pole.
- Bracket and hardware shall be Black, Federal Standard No. 595, Color No. 37038 as approved by the City of New Britain. Camera Enclosure shall be manufacturer's standard color and not painted black.

Extension Bracket: The extension bracket shall conform to the following requirements:

- Single arm [10' (3.0m) or less], or Truss type [10' (3.0m) or greater].
- Length shown on plan.
- Clamp-on attachment to pole shaft 1' (300mm) from top of pole.
- Designed to support minimum 30 lbs. (13.6 Kg), 2 sq. ft. (.2 sq. M) end load with minimal movement from wind.
- Schedule 40, 2" IPS galvanized pipe.
- Heavy duty galvanized finish
- Refer to detail drawing contained herein.
- Extension Bracket and hardware shall be Black, Federal Standard No. 595, Color No. 37038 as approved by the City of New Britain.

360 Degree Closed Loop System Video Detection Processor: The 360 Camera Video Detection Processor shall be the GridSmart GS<sub>2</sub> Processor and conform to the following requirements:

Functional:

- Connectivity: Local Area Network (LAN), Wide Area Network (WAN), Camera interfaces.
- NEMA TS1/ TS2, Type 170 and 2070 ATC compatible
- Four (4) USB 3.0 expansion ports.
- Front panel LED indicators displays calls and light states.
- Twenty-four (24) optically isolated I/O interface.
- Two (2) camera ports – Up to two (2) 360 Degree Camera Assembly; or one (1) 360 Degree Camera Assembly and four (4) IP video detection camera assembly (IPVDCA) or thermal cameras; or eight (8) IPVDCA or thermal cameras.
- Phase and detection display.
- Wi-Fi capable
- Power – 110/220 VAC 50/60 Hz
- Point and click zone drawing feature
- Digital flattening of image
- Omni-directional vehicle tracking
- Virtual pan-tilt-zoom
- Zone level visibility monitoring.
- Monitor phases and loops, generates calls to controllers.
- Support MJPEG video output
- Environmental : -29F to +165F (-34C to +74C), 0-95% non-condensing
- Fail-safe in the event of loss of video from 360CA or loss of power to 360CLSVDP.

- Shall be capable of configuring and adjusting the detection zone with the cabinet mounted VDM.
- Shall collect traffic data such as counts, turning movements, speed, and vehicle classification.
- Storage required to support collection of data.
- Support ability to transmit collected traffic data and alarm events from field devices to remote desktop pc

#### Application Software:

- Shall be provided at no additional cost
- Shall be capable of searching the network for other 360CLSVDP
- Shall be compatible with Windows operating system.
- Shall maintain an historical log of all configurations when site is modified
- Shall be capable Point and click zone drawing
- Shall feature digital flattening of image
- Shall feature the ability to digitally pan, tilt, and zoom within the camera assembly's field of view without movement of the camera.
- Detection zone data stored in non-volatile memory so that after recovery from power interruption, all parameters are returned to latest settings.
- Shall support the import and export of program database from notebook PC or remote desktop PC. The program database shall also be allowed to be transferred through a USB flash drive.
- Shall be capable of superimposing detection zone on real time video image from selected camera with time stamping capabilities.
- Shall be capable of monitoring real time video and adjusting zones in field or remotely while 360CLSVDP is actuating the traffic controller.
- Shall provide visual confirmation of detection by highlighting detection zone symbols.
- Shall support quad view video monitoring.
- Shall be capable of syncing with a cloud network resource to allow for program database and collected traffic data backup.
- Shall maintain a database of current and historical traffic data, and allow users to run reports against the data to include traffic counts, turning movements, speed, vehicle classification, red/green occupancy, and cycle lengths.
- Shall be capable of displaying data in a graph or chart format.
- Shall be capable of selecting data collection resolution in at least 15, 30, and 60-minute intervals through software.
- Shall provide a means by which alerts can be configured to be delivered to different individuals via email.
- Report output formats shall include at minimum PDF, rich text format, and Microsoft Excel formats.

Physical:

- Shelf mounted, stand alone design.
- Aluminum card rack frame capable of accepting four (4) 360CLSVDP modules.
- TS2 harness cable.
- Standard Ethernet and USB connectors for video input and video output.
- Female metal shell connector with latching clamp for NEMA TS 2 detector outputs and inputs.
- LED indications to monitor all detector outputs.
- Side or rear mounted connectors and controls are not allowed on standalone units.
- NEMA FR-4 glassepoxy or equivalent circuit boards.

Ethernet Repeater:

- Utilize Ethernet repeater if CAT6 cable distance is over 328'.

Ethernet Switch:

- Power Over Ethernet (POE) switch
- Ports for up-to four (4) IPVDCA or thermal cameras.
- Powder coated aluminum.
- Dual purpose LED port lights.
- RJ-45 CAT6 connectivity.
- Environmental: -29F to +165F (-34C to +74C).
- NEMA TS2 compliant.

Video Encoder:

- Power Over Ethernet (POE)
- Video: H.264 (MPEG-4 Part 10/AVC) Baseline and Main Profile
- Compression: Motion JPEG
- Resolutions: 176x120 to 720x576, 176x120 to 1536x1152 for quad view.
- Frame rate:
  - H.264: 25/30 (50/60 Hz) fps,
  - 15fps in quad view in full resolution,
  - Motion JPEG: 25/30 (50/60 Hz) fps,
  - 15fps in quad view in full resolution.
- Video Streaming: Multi-stream H.264 and Motion JPEG: One H.264 and one JPEG stream on each channel (8 streams in total) in full frame rate individually configured streams in max. resolution at 25/30 fps; more streams if identical or limited in frame rate/ resolution. Controllable frame rate and bandwidth; VBR/CBR H.264.
- Environmental: -40F to +167F (-40C to +75C), 10-95% non-condensing.
- NEMA TS2 compliant.

**Ethernet Protection Module:**

- Either shelf mounted or standalone design.
- Protect 360CA, IPVDC, thermal cameras and 360CLSVDP in the event of a surge or lightning.

**Peripherals:**

- Separable Keypad & Joystick or Computer Mouse including all necessary cables for connectivity to 360CLSVDP.

**Environmental:**

- Comply with NEMA TS 2, Section 2 requirements for Controller Assembly.
- Pass following NEMA TS 2 tests and applicable test procedures.
  - Vibration: Section 3.13.3, Section 3.13.8.
  - Shock: Section 3.13.4, Section 3.13.9.
  - Transients, Temperature, Voltage and Humidity: Section 3.13.7.
  - Power Interruption: Section 3.13.10.

**23 AWG 4 Twisted Pair Category 6 Cable:**

- Supply the 360CA power and return the video signal to the 360CLSVDP.
- Outdoor Aerial CAT6 cable with UV insulation.
- Rated for 48VDC
- 250MHZ, shielded, gel-filled (flooded core) direct burial grade.
- Polyethylene insulation.
- Shall be installed continuous between the 360CA and 360CLSVDP.
- Cable shall be installed according to TIA/EIA-568-B.
- Other type cable may be substituted at the request of the 360CLSVDP manufacturer.

**Construction Methods:**

A Site Survey shall be performed with the 360CLSVDP manufacturer representative at all 360VIDS locations prior to installation. The purpose of the survey is to optimize the performance from the 360VIDS equipment when it is installed and insure that it will meet the accuracy requirements specified previously. Prior to installation, submit the results of this survey to the Engineer in a report, which lists all 360VIDS locations with any recommended changes to camera locations, mounting adjustments, camera lens adjustments, and desired detection zone locations.

The 360VIDS equipment shall be installed in accordance with the manufacturer instructions and recommendations to achieve the detection zones as shown in the plans and accuracy as described in these specifications. The location of the 360CA shown on the plan may be revised as a result of the Site Survey. Peripherals are to be furnished and fully installed in an easily accessible

position within the controller cabinet. Leave proper clearance(s) surrounding video monitor to allow for accessible connections and space to utilize surrounding equipment.

Warranties and Guarantees for 360CA and 360CLSVDP shall be provided to the City of New Britain in accordance with Article 1.06.08 of the Standard Specifications. Warranties for all equipment furnished as part of this Contract are to cover a period of 36 months following successful completion of the entire intersection acceptance test.

### **Method of Measurement:**

The 360 degree Camera Assembly will be measured for payment as the number of 360 degree cameras furnished, installed operational and accepted.

The Extension Bracket will be measured for payment as the number of brackets furnished, installed and accepted.

The 360 degree Closed Loop System Video Detection Processor will be measured for payment as the number of units including all additional work and materials listed in Basis of Payment, furnished, installed, operational and accepted.

23 AWG 4 Twisted Pair Category 6 Cable will be measured for payment as linear feet, furnished, installed and accepted.

### **Basis of Payment:**

360 degree Camera Assembly will be paid for at the Contract unit price for “360 Degree Camera Assembly” which price shall include 360 degree camera, enclosure, brackets and hardware used to attach the 360 degree camera assembly to a support structure or extension bracket, all material, equipment, paint, painting, warranty, tools, labor and work incidental thereto.

Extension Bracket will be paid for at the Contract unit price for “Extension Bracket” which price shall include bracket, paint, painting, all labor, tools and equipment necessary to attach the bracket to a pole shaft.

360 degree Closed Loop System Video Detection Processor will be paid for at the Contract unit price for “360 degree Closed Loop System Video Detection Processor” which price shall include the manufacturers’ site survey, unlimited number of any necessary 360VIDS configuration software and license, card rack frame, power supply, all miscellaneous hardware such as PC interface cable with connectors, necessary peripherals such as Ethernet repeater, Ethernet switch, video encoder, Ethernet protection module, documentation, warranty, labor, tools and equipment necessary to make the 360VIDS fully operational.

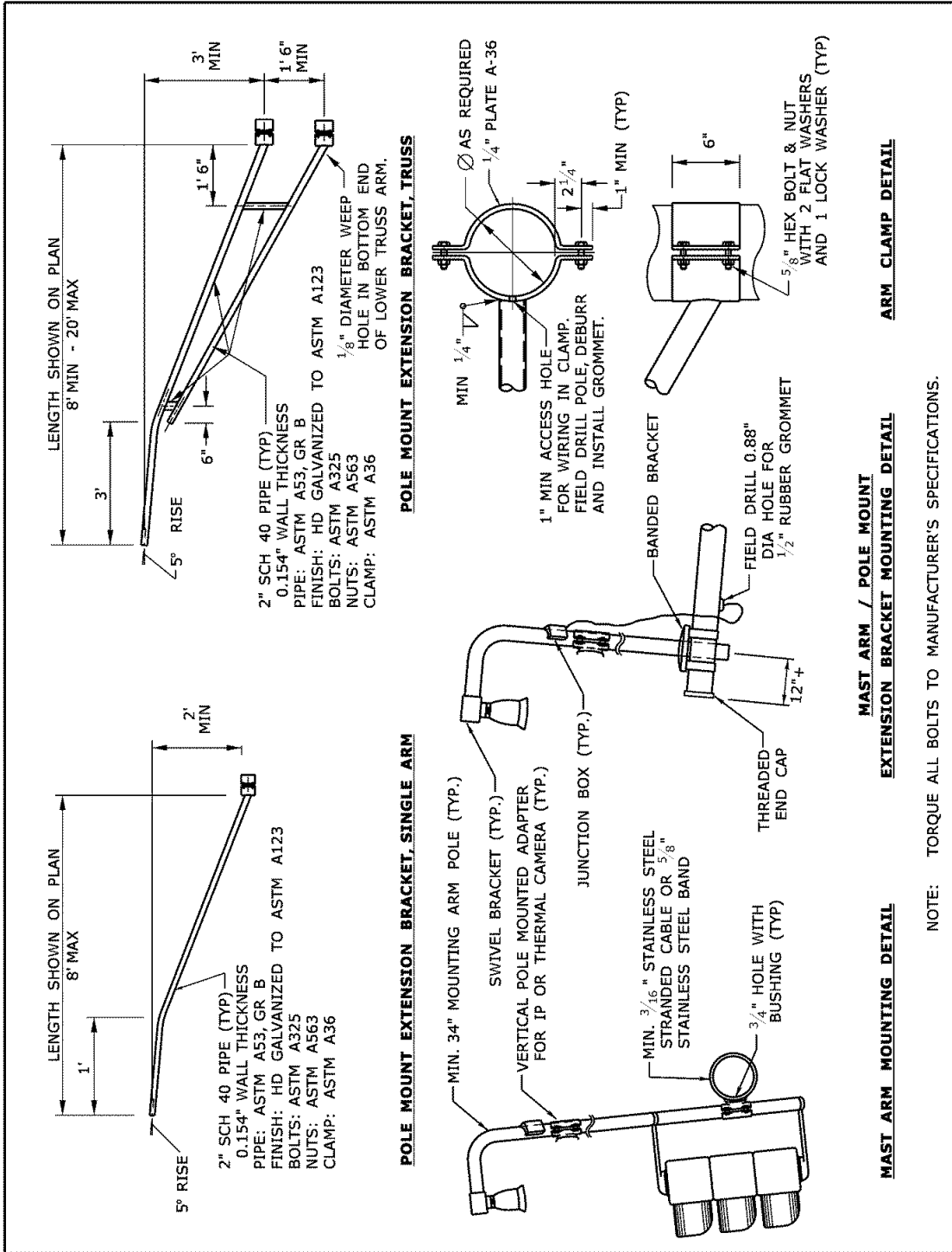
23 AWG 4 Twisted Pair Category 6 Cable will be paid for at the Contract unit price per linear foot for “23 AWG 4 Twisted Pair Category 6 Cable” which price shall include installation, all



connectors, labor, tools and equipment necessary to install the cable between the 360CA and the 360CLSVDP.

<u>Pay Item</u>	<u>Pay Unit</u>
360 Degree Camera Assembly	ea.
Extension Bracket	ea.
360 Degree Video Detection Processor	ea.
23 AWG 4 Twisted Pair Category 6 Cable	l.f.

29 - 6003-05-03-au2619-specs - 1112286a - new britain gridsmart.docx



## **ITEM #1118012A – REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT**

Section 11.18: Replace the entire section with the following:

### **11.18.01 – Description:**

Remove all abandoned traffic signal equipment. Restore the affected area. Where indicated on the plans remove and reinstall existing traffic signal equipment to the location(s) shown.

Lead paint is presumed present on the painted surface of all cabinets and structures located within project limits. Any activities performed by the contractor that results in a painted surface being impacted or altered, shall be performed in accordance OSHA Lead in Construction Standard 29CFR 1926.62, or the painted surface shall be tested prior to any paint being disturbed by a qualified third party hired by the contractor to confirm that no lead is present.

### **11.18.02 – Materials:**

The related sections of the following specifications apply to all incidental and additional material required for the proper relocation of existing equipment and the restoration of any area affected by this work.

- Division III, “Materials Section” of the Standard Specifications.
- Current Supplemental Specifications to the Standard Specifications.
- Applicable Special Provisions to the Standard Specifications.
- Current Department of Transportation, Functional Specifications for Traffic Control Equipment.

### **Article 11.18.03 - Construction Methods:**

Schedule/coordinate the removal and/or relocation of existing traffic signal equipment with the installation of new equipment to maintain uninterrupted traffic signal control. This includes but is not limited to vehicle signals and detectors, pedestrian signals and pushbuttons, co-ordination, and pre-emption.

#### **Abandoned Equipment**

The contract traffic signal plan usually does not show existing equipment that will be abandoned. Consult the existing traffic signal plan for the location of abandoned material especially messenger strand, conduit risers, and handholes that are a distance from the intersection. A copy of the existing plan is usually in the existing controller cabinet. If not, a plan is available from the Department of Public Works upon request.

Unless shown on the plans it is not necessary to remove abandoned conduit in-trench and conduit under-roadway.

When a traffic signal support strand, rigid metal conduit, down guy, or other traffic signal equipment is attached to a utility pole, secure from the pole custodian permission to work on the pole. All applicable Public Utility Regulatory Authority (PURA) regulations and utility company requirements govern. Keep utility company apprised of the schedule and the nature of the work. Remove all abandoned hardware, conduit risers, and down guys, Remove anchor rods, to 6” (150mm) below grade.

When underground material is removed, backfill the excavation with clean fill material. Compact the fill to eliminate settling. Remove entirely the following material: pedestal foundation; controller foundation; handhole; pressure sensitive vehicle detector complete with concrete base. Unless otherwise shown on the plan, remove steel pole and mast arm foundation to a depth of 2 feet (600mm) below grade. Restore the excavated area to a grade and condition compatible with the surrounding area.

- If in an unpaved area apply topsoil and establish turf in accordance with Section 9.44 and Section 9.50 of the Standard Specifications.
- If in pavement or sidewalk, restore the excavated area in compliance with the applicable Sections of Division II, “Construction Details” of the Standard Specifications.

### Relocated Equipment

In the presence of the Engineer, verify the condition of all material that will be relocated and reused at the site. Carefully remove all material, fittings, and attachments in a manner to safeguard parts from damage or loss. Replace at no additional cost, all material which becomes damaged or lost during removal, storage, or reinstallation.

### Salvage Equipment

<b>Salvage Material</b>	<b>Value</b>
Controller Cabinet, Complete including but not limited to the following: Conflict Monitor Coordination Equipment Vehicle Detection Equipment	\$ 500.00
Controller Unit	\$ 500.00
Traffic Signals	\$ 100.00

All material not listed as salvage becomes the property of the Contractor; which assumes all liabilities associated with material’s final disposition.

In the presence of the Engineer, verify the condition and quantity of salvage material prior to removal. After removal transport and store the material protected from moisture, dirt, and other damage. Coil and secure copper cable separate from other cable such as galvanized support strand.

Within 4 working days of removal, return the salvage material to the City as directed by the Engineer. Supply all necessary manpower and equipment to load, transport, and unload the material. The condition and quantity of the material after unloading will be verified by the Engineer.

City of New Britain  
Public Work Yard  
55 Harvard Street  
New Britain, CT

Contact Department of Public Works at least 24 hours prior to delivery.

**Article 11.18.04 – Method of Measurement:**

This work will be measured as a Lump Sum.

**Article 11.18.05 – Basis of Payment:**

This work will be paid for at the contract lump sum price for “Removal and/or Relocation of Traffic Signal Equipment” which price shall include relocating signal equipment and associated hardware, all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of signal equipment/materials designated for salvage and all equipment, material, tools and labor incidental thereto. This price shall also include removing and disposing of traffic signal equipment not to be salvaged and all equipment, material, tools and labor incidental thereto.

Payment is at the contract lump sum price for “Removal and/or Relocation of Traffic Signal Equipment” inclusive of all labor, vehicle usage, storage, and incidental material necessary for the complete removal of abandoned equipment/material and/or relocation of existing traffic signal equipment/material. Payment will also include the necessary labor, equipment, and material for the complete restoration of all affected areas.

A credit will be calculated and deducted from monies due the Contractor equal to the listed value of salvage material not returned or that has been damaged and deemed unsalvageable due to the Contractor’s operations.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal and/or Relocation of Traffic Signal Equipment	l.s.

- ITEM #1118051A – TEMPORARY SIGNALIZATION (SITE NO. 1)**
- ITEM #1118052A – TEMPORARY SIGNALIZATION (SITE NO. 2)**
- ITEM #1118053A – TEMPORARY SIGNALIZATION (SITE NO. 3)**
- ITEM #1118054A – TEMPORARY SIGNALIZATION (SITE NO. 4)**
- ITEM #1118055A – TEMPORARY SIGNALIZATION (SITE NO. 5)**
- ITEM #1118056A – TEMPORARY SIGNALIZATION (SITE NO. 6)**
- ITEM #1118057A – TEMPORARY SIGNALIZATION (SITE NO. 7)**
- ITEM #1118058A – TEMPORARY SIGNALIZATION (SITE NO. 8)**
- ITEM #1118059A – TEMPORARY SIGNALIZATION (SITE NO. 9)**
- ITEM #1118060A – TEMPORARY SIGNALIZATION (SITE NO. 10)**
- ITEM #1118071A – TEMPORARY SIGNALIZATION (SITE NO. 11)**
- ITEM #1118072A – TEMPORARY SIGNALIZATION (SITE NO. 12)**
- ITEM #1118073A – TEMPORARY SIGNALIZATION (SITE NO. 13)**
- ITEM #1118074A – TEMPORARY SIGNALIZATION (SITE NO. 14)**
- ITEM #1118075A – TEMPORARY SIGNALIZATION (SITE NO. 15)**
- ITEM #1118076A – TEMPORARY SIGNALIZATION (SITE NO. 16)**
- ITEM #1118077A – TEMPORARY SIGNALIZATION (SITE NO. 17)**
- ITEM #1118078A – TEMPORARY SIGNALIZATION (SITE NO. 18)**

**Description:**

Work under this item shall consist of providing Temporary Signalization (TS) at the intersections shown on the plans

1. Existing Signalized Intersection: The Contractor shall keep each traffic signal completely operational at all times during construction through the use of existing signal equipment, temporary signal equipment, new signal equipment, or any combination thereof once TS has started as noted in the section labeled “Duration.”
2. Unsignalized Intersection: The Contractor shall provide TS during construction activities and convert the temporary condition to a permanent traffic signal upon project completion. The Contractor shall furnish, install, maintain, and relocate equipment to provide a complete temporary traffic signal, including but not limited to the necessary support structures, electrical connection and disconnection (if required) and energy supply, vehicle and pedestrian indications, vehicle and pedestrian detection (paid for under Item #11112XXA – Temporary Detection {Site No. X}), pavement markings, and signing.

**Materials:**

- Pertinent articles of the Standard Specifications
- Supplemental Specifications and Special Provisions contained in this contract

**Construction Methods:**

The Contractor shall perform a Preliminary Inspection and submit a Temporary Signalization (TS) Plan as described herein. No physical work will be allowed at any location until the requirements of the Preliminary Inspection and Temporary Signalization (TS) Plan have been met.

**1. Preliminary Inspection**

Prior to beginning any physical work, the Contractor shall meet with the Engineer and a representative from the DOT Electrical Maintenance Office (Town representative for a Town owned signal), to inspect and document (for the Engineer's concurrence) the existing traffic signal's physical and operational condition prior to implementing any Temporary Signalization (TS.) The inspection shall include, but not be limited to, the condition of the following:

- Controller Assembly (CA)
  - Controller Unit (CU)
  - Detection Equipment
  - Pre-emption Equipment
  - Coordination Equipment
- Vehicle and Pedestrian Signals
- Vehicle and Pedestrian Detectors
- Emergency Vehicle Pre-emption System (EVPS) \*
- Interconnect Cable and Splice Enclosures
- Support Structures
- Handholes, Conduit and Cable

It may be necessary to repair or replace equipment that is missing, damaged, or malfunctioning. The Contractor shall prepare a list of items for replacement or repair. If authorized by the Engineer, this work will be considered "Extra Work" under Article 1.09.04.

\* At a State owned signal the EVPS equipment is usually owned by the municipality. The Engineer will notify the municipality of the inspection schedule and information relating to its EVPS equipment as required.

The Preliminary Inspection meeting shall also include discussion of potential utility conflicts according to the *Utilities* section under *TS Plan* below.

## 2. Temporary Signalization (TS) Plan

At least 30 days prior to implementation of each stage, the Contractor shall submit a 1:40 (1:500 metric) scale TS plan in pdf format for each location to the Engineer for review and comment. This TS Plan shall include, but not be limited to the following:

- Survey Ties
- Dimensions of Lanes, Shoulders, and Islands
- Slope Limits
- Clearing and Grubbing Limits
- Signal Phasing and Timing
- Location of Signal Appurtenances such as Supports, Signal Heads, Pedestrian Push buttons, Pedestrian Signals
- Location of Signing and Pavement Markings (stop bars, lane lines, etc.)
- Location, method, and mode of Temporary Detection
- Location of utilities and potential conflicts

Review of the TS plan does not relieve the Contractor of ensuring the TS meets the requirements of the MUTCD. The existing traffic signal plan of record for State-owned traffic signals is available from the Division of Traffic Engineering upon request. The Contractor may request existing traffic signal plans for Town-owned traffic signals from the Town.

It is acceptable to use the existing traffic signal plan as the TS plan by marking up the existing plan to show any needed changes.

The Contractor shall not implement the TS plan until all review comments have been addressed.

The TS Plan shall also address the following elements:

### Earthwork

The Contractor shall perform the necessary clearing and grubbing and the grading of slopes required for the installation, maintenance, and removal of the TS equipment. Upon termination of the TS, the Contractor shall restore the affected area to its prior condition and to the satisfaction of the Engineer.

### Maintenance and Protection of Traffic

The Contractor shall furnish, install, maintain, relocate, and remove signal-related signing (lane-use, signal ahead, NTOR, etc.), and pavement markings, as needed.

The Contractor shall install, relocate, or remove, equipment in a manner to cause no hazard to pedestrians, traffic or property. The Contractor shall maintain traffic as



specified in the Special Provisions “Prosecution and Progress” and “Maintenance and Protection of Traffic” in the Contract.

#### Utilities

The Contractor shall verify that proposed temporary and/or relocated signal equipment will not conflict with proposed project utility relocations. The Contractor shall ensure that temporary span/temporary poles will not restrict the ability to shift utility cables off of the poles.

The Contractor shall coordinate its TS activities with all utility companies in the project area to ensure that the proposed temporary and/or relocated signal equipment will not be in conflict with existing utilities. The Contractor shall coordinate any utility work that may be needed prior to the Contractor implementing the TS plan.

#### Electrical Service and Telephone Service at Existing Signalized Intersections

The Contractor shall be responsible for relocating and changing any electrical service or telephone service source if required. Any arrangements with these companies and costs associated with any relocation or change shall be paid for by the Contractor. The Contractor shall ensure that the party previously responsible for the monthly payment of service shall continue to be responsible for that payment during TS.

#### Electrical Service for TS at Unsignalized Intersections

The Contractor shall be responsible for providing electrical service for TS at unsignalized intersections. All charges and all arrangements with the power company, including service requests, scheduling, and monthly bills in accordance with Section 10.00.12 and Section 10.00.13 of the Standard Specifications shall be the responsibility of the Contractor. The Contractor shall remove the service or leave the service if it will become permanent as shown on the plans or as directed by the Engineer.

#### Temporary Signalization

The Contractor shall furnish, install, maintain, relocate, and remove existing, temporary, and proposed traffic signal equipment and all necessary hardware; modifications to or furnishing of a new CA; and reprogramming of the CU phasing and timing; and any other incidentals related to this TS, as many times as necessary for each stage/phase of construction to maintain and protect traffic and pedestrian movements as shown on the plans or as directed by the Engineer.

#### Inspection

When requested by the Engineer, the TS will be subject to a field review by a representative of the Division of Traffic Engineering and/or the Town, The Contractor shall revise the TS as needed to address comments.

Detection

The Contractor shall provide vehicle detection on the existing, temporary, and/or new roadway alignment for all intersection approaches that have existing detection, detection in the final condition as shown on the signal plan, or as directed by the Engineer. The Contractor shall keep existing pedestrian pushbuttons accessible and operational at all times during TS. Temporary Detection is described and is paid for under Item # 11112XXA - Temporary Detection (Site No. X)

Emergency Vehicle Pre-emption System (EVPS)

The Contractor shall furnish, install, maintain, relocate, and remove the equipment necessary to keep the existing EVPS operational as shown on the plan. The Contractor shall not disconnect or alter the EVPS without the knowledge and concurrence of the Engineer and the EVPS owner. The Contractor shall schedule all EVPS relocations so that the system is out of service only when the Contractor is actively working. The Contractor shall ensure EVPS is returned to service and is completely operational at the end of the work day and shall keep the EVPS owner apprised of all changes to the EVPS.

Coordination

The Contractor shall furnish, install, maintain, relocate, and remove the equipment necessary to keep the intersection coordinated to adjacent signals as shown on the plan. The Contractor shall not disconnect the interconnect without the approval of the Engineer.

- Closed Loop System: If it is necessary to disconnect the communication cable, the Contractor will notify the Engineer and the Bridgeport Operation Center (BOC) or the Newington Operation Center (NOC) prior to disconnect and also after it is reconnected.
- Time Base System: The Contractor shall program and synchronize all Time Clock/Time Base Coordination (TC/TBC) units as necessary.

Maintenance

Once TS is in effect, the Contractor shall assume all maintenance responsibilities of the entire installation in accordance with Section 1.07.12 of the Standard Specifications. The Contractor shall notify the Engineer for the project records the date that Temporary Signalization begins. The Contractor shall coordinate with the Engineer to notify the following parties that maintenance responsibility has been transferred to the Contractor:

Signal Owner  
CT DOT Electrical Maintenance Office or  
Town Representative  
Local Police Department

The Contractor shall provide the Engineer a list of telephone numbers of personnel who will be on-call during TS and shall respond to traffic signal malfunctions by having a

representative at the site within three hours from the initial contact. Any traffic signal malfunction shall be made operational according to plan within twenty-four (24) hours.

If the Engineer determines that the nature of a malfunction requires immediate attention and/or the Contractor does not respond within three (3) hours, then an alternate maintenance service will be called to repair the signal. Expenses incurred by the alternate maintenance service for each call will be deducted from monies due to the Contractor with a minimum deduction of \$1,000. The alternate maintenance service may be the owner of the signal or another qualified electrical contractor.

#### Duration

Temporary Signalization shall commence when the Contractor begins physical work at a particular intersection.

- a) For intersections with a State furnished controller, TS terminates when the inspection of the permanent signal is complete and operational and is accepted by the Engineer.
- b) For intersections with a Contractor furnished controller, Temporary Signalization terminates at the beginning of the 30 day test period for the permanent signal.

#### Ownership

The Contractor shall remove and deliver any existing equipment that is designated as salvage to its original owner upon completion of use. Any temporary equipment supplied by the Contractor shall be removed by the Contractor unless noted otherwise.

#### **Method of Measurement:**

Temporary Signalization (TS) shall be measured for payment as follows:

Fifty percent (50%) shall be paid when the TS for that site is operational as shown on the plan and to the satisfaction of the Engineer.

Fifty percent (50%) shall be paid upon termination of the TS as described herein.

#### **Basis of Payment:**

This work shall be paid at the contract Lump Sum price for “Temporary Signalization (Site No.)” for each site. This price includes the preliminary inspection, TS plan for each stage/phase, furnishing, installing, maintaining, relocating and revising traffic signal equipment, controller assembly modifications, controller unit program changes such as phasing and timing, removing existing, temporary, and proposed traffic signal equipment, arrangements with utility companies, towns or cities including the fees necessary for electric and telephone service, clearing and grubbing, earthwork and grading, area restoration and all necessary hardware, materials, labor, and work incidental thereto.

All material and work for signing and pavement markings is paid for under the appropriate Contract items.

All material and work necessary for vehicle and pedestrian detection for TS is paid for under item 11112XXA - Temporary Detection (Site No. X).

All Contractor supplied items that will remain the Contractor's property shall be included in the contract Lump Sum price for "Temporary Signalization."

Any items installed as part of the permanent installation will be paid for under those separate pay items in the Contract.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Signalization (Site No.)	L.S.

31 - 6003-05-03-au2619-specs - 1118051a - temporary signalization site 1.doc

## **ITEM #1206023A – REMOVAL AND RELOCATION OF EXISTING SIGNS**

Section 12.06 is supplemented as follows:

### **Article 12.06.01 – Description is supplemented with the following:**

Work under this item shall consist of the removal and/or relocation of designated side-mounted extruded aluminum and sheet aluminum signs, sign posts, sign supports, and foundations where indicated on the plans or as directed by the Engineer. Work under this item shall also include furnishing and installing new sign posts and associated hardware for signs designated for relocation.

### **Article 12.06.03 – Construction Methods is supplemented with the following:**

The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the State.

Foundations and other materials designated for removal shall be removed and disposed of by the Contractor as directed by the Engineer and in accordance with existing standards for Removal of Existing Signing.

Sheet aluminum signs designated for relocation are to be re-installed on new sign posts.

### **Article 12.06.04 – Method of Measurement is supplemented with the following:**

Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

### **Article 12.06.05 – Basis of Payment is supplemented with the following:**

This work will be paid for at the contract lump sum price for “Removal and Relocation of Existing Signs” which price shall include relocating designated extruded aluminum and sheet aluminum signs, sign posts, and sign supports, providing new posts and associated hardware for relocated signs, removing and disposing of foundations and other materials, and all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and

unloading of extruded aluminum signs, sheet aluminum signs, sign posts, and sign supports designated for scrap and all equipment, material, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal and Relocation of Existing Signs	L.S.

31a - 6003-05-03-au2619-specs - 1206023a-removal\_\_relocation\_of\_existing\_signs.doc

**ITEM #1208931A – SIGN FACE - SHEET ALUMINUM (TYPE IX  
RETROREFLECTIVE SHEETING)**

**ITEM #1208932A – SIGN FACE - SHEET ALUMINUM (TYPE IV  
RETROREFLECTIVE SHEETING)**

*Section 12.08 is supplemented and amended as follows:*

**12.08.01—Description:**

*Add the following:*

This item shall also include field testing of metal sign base posts as directed by the Engineer.

**12.08.03—Construction Methods:**

*Delete the last sentence and add the following:*

Metal sign base posts shall be whole and uncut. Sign base post embedment and reveal lengths shall be as shown on the plans. The Contractor shall drive the metal sign base posts by hand tools, by mechanical means or by auguring holes. If an obstruction is encountered while driving or placing the metal sign base post, the Contractor shall notify the Engineer who will determine whether the obstruction shall be removed, the sign base post or posts relocated, or the base post installation in ledge detail shall apply. Backfill shall be thoroughly tamped after the posts have been set level and plumb.

**Field Testing of Metal Sign Posts:** When the sign installations are complete, the Contractor shall notify the Engineer the Project is ready for field testing. Based on the number of posts in the Project, the Engineer will select random sign base posts which shall be removed by the Contractor for inspection and measurement by the Engineer. After such inspection is completed at each base post location, the Contractor shall restore or replace such portions of the work to the condition required by the Contract. Refer to the table in 12.08.05 for the number of posts to be field tested.

**12.08.04—Method of Measurement:**

*Add the following:*

The work required to expose and measure sign base post length and embedment depth using field testing methods, and restoration of such work, will not be measured for payment and shall be included in the general cost of the work.

**12.08.05—Basis of Payment:**

*Replace the entire Article with the following:*

This work will be paid for at the Contract unit price per square foot for “Sign Face - Sheet Aluminum” of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

**Pay Factor Scale:** Work shall be considered defective whenever the base post length or base post embedment depth is less than the specified length by more than 2 inches. If the number of defects results in rejection, the Contractor shall remove and replace all metal sign base posts on the Project, at no cost to the Department.

**Number of Posts to be Tested and Pay Factors (Based on Number of Defects)**

<b>Number of Posts in Project =&gt;</b>	<b>51-100</b>	<b>101-250</b>	<b>251-1000</b>	<b>&gt;1000</b>
<b>Sample Size=&gt;</b>	<b>5 Posts</b>	<b>10 Posts</b>	<b>40 Posts</b>	<b>60 Posts</b>
0 Defects	1.0	1.0	1.025	1.025
1 Defect	0.9	0.95	0.975	0.983
2 Defects	Rejection	0.9	0.95	0.967
3 Defects	Rejection	Rejection	0.925	0.95
4 Defects	Rejection	Rejection	0.9	0.933
5 Defects	Rejection	Rejection	Rejection	0.917
6 Defects	Rejection	Rejection	Rejection	0.9
7 or more Defects	Rejection	Rejection	Rejection	Rejection

Note: Projects with 50 or fewer posts will not include field testing