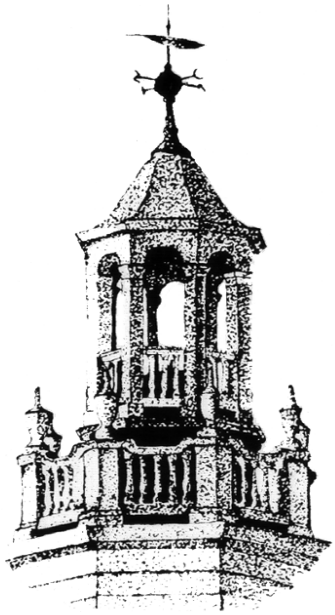
PROJECT MANUAL

FOR

NEW RESTROOMS FACILITY
WESTSIDE CAMPUS
BID NO. 2020-MRC-0002
PROJECT NO. BI-RD-306

NOVEMBER 14, 2019



FACILITIES PLANNING & ENGINEERING

WESTERN CONNECTICUT STATE UNIVERSITY
181 WHITE STREET
DANBURY, CONNECTICUT 06810

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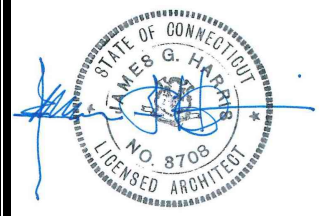
Project Title:	NEW RESTROOMS FACILITY – Westside Campus, Western Connecticut State University
Project Location:	Danbury, Connecticut
Project Number:	BI-RD-306 / 2020-MRC-0002
Architect/Engineer:	Clohessy Harris and Kaiser LLC, 573 Hopmeadow St, P.O. Box 95, Simsbury, Connecticut 06070

SEALS, SIGNATURES, AND DATES OF DESIGN PROFESSIONALS OF RECORD



(Seal and Signature)

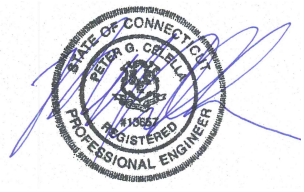
Architect Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Architect.

James G. Harris
(Print Consultant Name)
3708
License No.
7-31-2020
Expiration Date

(Seal and Signature)

Civil Engineer Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.

Chistopher Cardany
(Print Consultant Name)
PEN0021995
License No.
1-31-2020
Expiration Date



(Seal and Signature)

Structural Engineer Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.

Peter G. Celella
(Print Consultant Name)
13657
License No.
1-31-2020
Expiration Date

(Seal and Signature)

Electrical Engineer Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.

Craig F. Razza
(Print Consultant Name)
PEN.0018681
License No.
1-31-2020
Expiration Date

(Sea and Signature)

Mechanical Engineer Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.

Craig F. Razza
(Print Consultant Name)
PEN.0018681
License No.
1-31-2020
Expiration Date

(Seal and Signature)

Fire-Protection Engineer Professional Certification:
I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.

Craig F. Razza
(Print Consultant Name)
PEN.0018681
License No.
1-31-2020
Expiration Date

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NEW RESTROOMS FACILITY
WESTSIDE CAMPUS
BID NO. 2020-MRC-0002

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INVITATION TO BID

Notice is hereby given that WESTERN CONNECTICUT STATE UNIVERSITY will accept bids for the following project:

NEW RESTROOMS FACILITY
WCSU WESTSIDE CAMPUS
BID NO. 2020-MRC-0002

Please Note: This Invitation to Bid is reserved for contractors currently holding a certificate, with a Building Group B Classification, issued through Connecticut's Department of Administrative Services' Prequalification Program. Bidders are advised that both the DAS Prequalification Certificate and Update (Bid) Statement must accompany the bid proposal; failure to do so will result in rejection of the bid. For information regarding the program, please contact the Construction Contractor Prequalification Program at 860-713-5280, or visit the State of Connecticut's Department of Administrative Services' web site at www.das.state.ct.us.

Bid specifications and documents can be obtained via the State of Connecticut's State Contracting Portal, www.biznet.ct.gov.

CHRO Requirements: The contractor who is awarded the contract to perform this state project must file and receive an approved Affirmative Action Plan by the Commission of Human Rights and Opportunities. The awarded contractor shall be required to solicit multiple bids per subcontract (class of work) from an assorted variety of subcontractors, non-trade related service providers, and/or material vendors that are currently certified by the State of Connecticut Dept. of Administrative Services (DAS) Supplier Diversity Program (set-aside) as a small business, or as a small business owned by an ethnic minority, woman, or disabled person. Small Business Set Aside requirements for this project: Minimum 25% of the total lump sum to certified SBE's with at least one-quarter (6.25%) of that amount to certified MBE's.

Western Connecticut State University is seeking bid proposals for all labor, materials and equipment required for the New Restroom Facility, located on the vacant site on and Sand Road on WCSU's Westside Campus. Generally, the scope of work shall include the following: A new 1,200 sf standalone restroom facility with auxiliary spaces for support.

All contractors are required to visit the site and become familiar with existing conditions. A mandatory pre-bid meeting is scheduled for Thursday, December 12, 2019 at 10:30 a.m., beginning at the site across from the Practice Field Parking Lot on Sand Road, located on WCSU's Westside Campus. Parking is available in the parking spaces along the site or in the lot across the street.

Any questions or discrepancies should be submitted in writing by 4:00 p.m., Tuesday, December 17, 2019 to the WCSU's Administrative Services/Purchasing Office, located on the lower level of University Hall, WCSU,181 White Street, Danbury, CT 06810; Attn: Mark Case; fax no. 203-837-8659; e-mail: casem@wcsu.edu. Responses to any and all inquiries shall be issued via addenda, no later than 4:00 p.m., Tuesday, December 23, 2019. Any and all addenda shall be posted on the DAS contracting portal.

Sealed bids should be submitted to Mr. Mark Case, Director for Administrative Services, University Hall, Lower Level, Western Connecticut State University, 181 White Street, Danbury, CT 06810. Bids should be submitted on or before Tuesday, January 14, 2020 at 2:30 p.m. Bids will be opened

publicly at the aforementioned time in the Purchasing Office. Bids received after that time will not be accepted. Interested parties are invited to attend. Bidders should submit bids in a sealed envelope with words, "Sealed Bid No. 2020-MRC-0002," and the due date. In the event of an unexpected closing by the University at the scheduled bid due date and time (i.e. inclement weather closing), the bid due date shall default to 2:30 p.m. on the next business day the University is open (a business day defined as Monday – Friday, excluding weekends). Closing information can be obtained via the University's website www.wcsu.edu or via the University's weather closing phone line, 203-837-9377.

Bids are to be based on the work called for on the sketches and specifications for the subject project, as well as any addenda issued during the bid process. Bids showing informalities, qualifications or conditions may be rejected at the option of the University. Each bidder must note receipt of any Addenda or bulletins when submitting a bid. All bidders shall verify dimensions and conditions at the site and be responsible for satisfying himself as to all requirements of the contract.

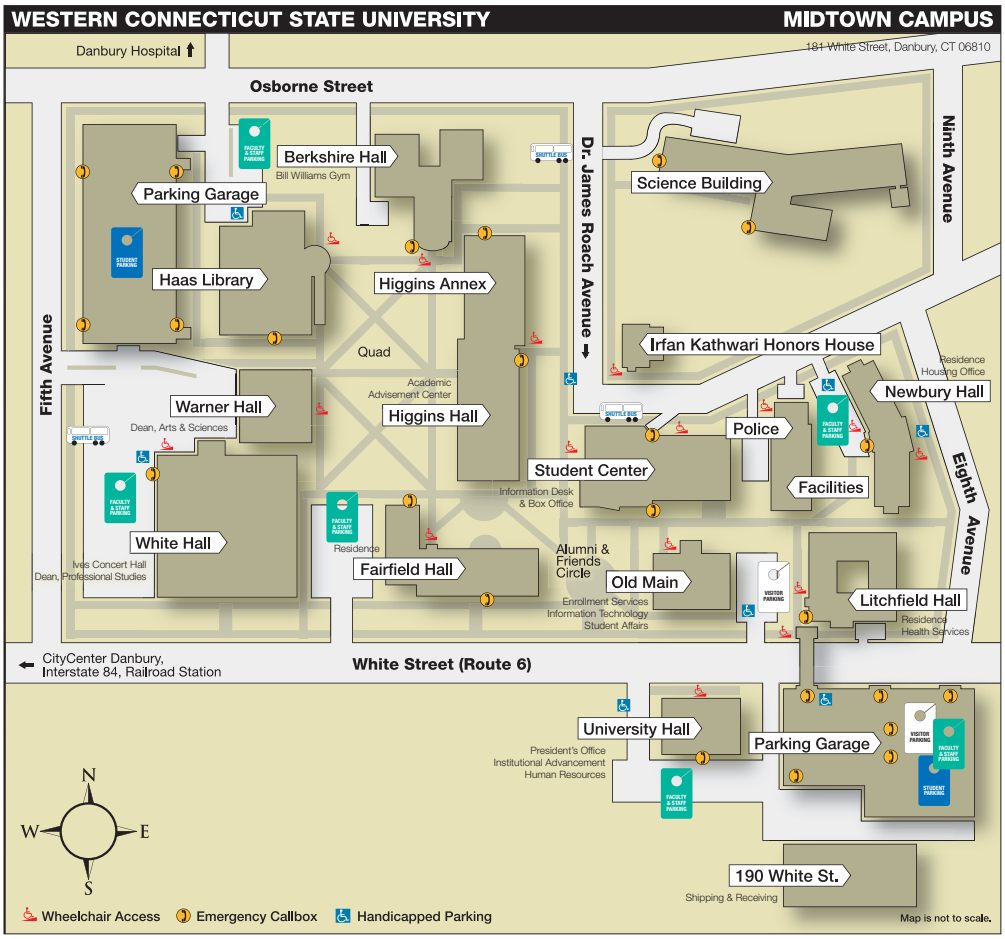
Bids must be held for a period of 90 calendar days following the date of the bid opening. Following 90 calendar days, if attempted negotiations with the lowest bidder fail to result in a contract, the University reserves the right to re-bid the project.

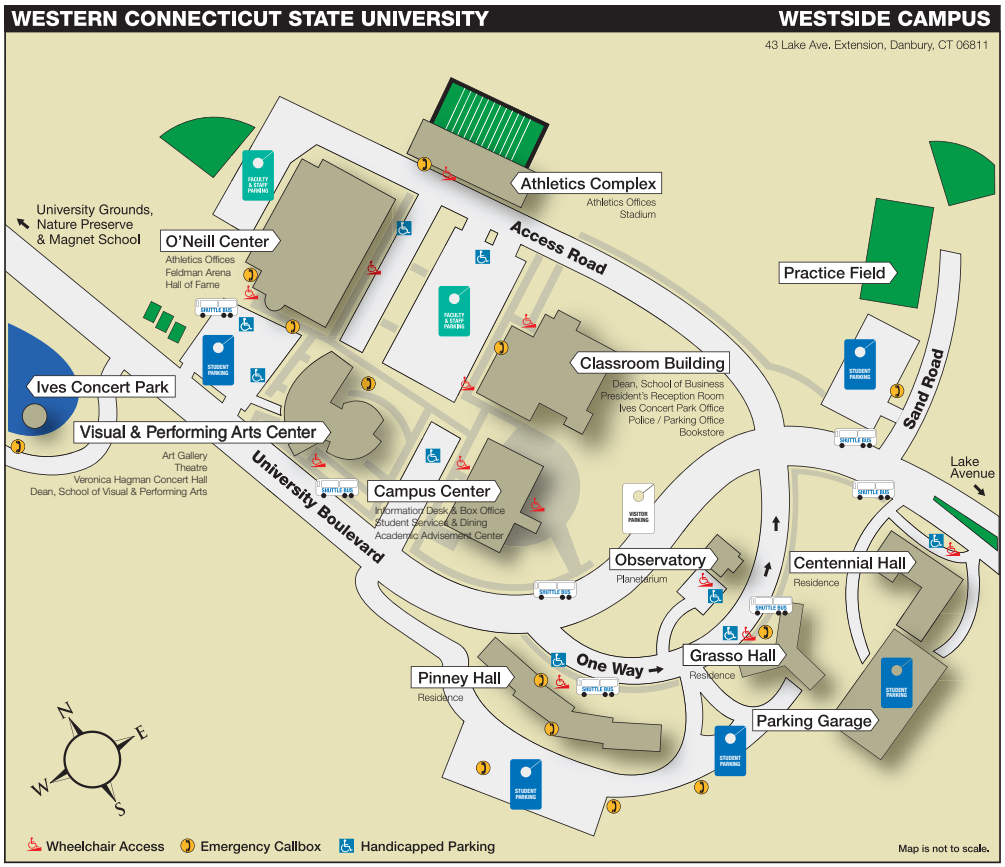
All work shall commence within two (2) weeks of issuance of contract or letter of intent; shop drawings submittal schedule within ten days after the award of the contract. All work must be completed no later than Tuesday August 4, 2020.

The University reserves the right to waive any technical defects in the bids, to reject any bids that do not conform to the terms described herein, and to accept or reject any part of any bid, and to reject all bids and, again, invite bids.

END

Campus Maps & Directions





To Midtown campus (181 White Street)

From the East: Take Exit 5 off I-84 to first traffic light (Clapboard Ridge Road); turn right and continue on Main Street to White Street (fifth traffic light); turn left onto White Street and continue one half mile to campus on left.

From the West: Take Exit 5 off I-84 to first traffic light (Main Street); turn right and continue on Main Street to White Street (fourth traffic light); turn left onto White Street and continue one half mile to campus on left. Visitor parking is available in the lot adjacent to Old Main on the Midtown campus.

To Westside campus (43 Lake Ave. Extension)

Take Exit 4 off I-84; turn right onto Lake Avenue. Travel approximately one mile to campus entrance on right.

Campus-to-Campus

Midtown to Westside: Follow White Street and take a right onto Main Street (third traffic light). Follow Main Street to third traffic light (Main Street becomes Clapboard Ridge). Turn left onto I-84 West. Take Exit 4 off I-84. Turn right onto Lake Avenue. Travel approximately one mile. Campus entrance is on the directly across from Stop & Shop. General parking is available along University Boulevard.

Westside to Midtown: Turn left onto Lake Avenue for approximately one mile. Turn left onto I-84 East (third traffic light). Take Exit 5 off I-84 to first traffic light (Main Street). Turn right and continue on Main Street to White Street (fourth traffic light). Turn left onto White Street and continue one half mile. The campus is on the left.

WESTERN CONNECTICUT STATE UNIVERSITY

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INSTRUCTIONS TO BIDDERS

A. Bids are to be based on the work called for on the drawings and specifications for the subject project, as well as any addenda issued during the bid process. Bids showing informalities, qualifications or conditions may be rejected at the option of the University.

The University reserves the right to waive any technical defects in the bids, to reject any bids that do not conform to the terms described herein, and to accept or reject any part of any bid, and to reject all bids and again invite bids.

B. Time limits will be as here-in-forth set:

1. All work shall commence within two (2) weeks of issuance of contract or letter of intent; shop drawings submittal schedule must be submitted within ten (10) days after the award of the contract.

2. All work must be completed no later than Tuesday, August 4, 2020.

C. Addenda – Any addenda issued to this bid will be posted on the State of Connecticut Department of Administrative Services' website bid portal, under Western Connecticut State University's (WCSU) bid postings. The DAS website address is www.das.state.ct.us. Each bidder must note receipt of any Addenda or bulletins when submitting a bid.

D. The bidding documents are as follows:

1. Project Manual entitled "New Restroom Facility" dated November 14, 2019.
2. Drawings entitled "New Restroom Facility.

E. The bid package will contain the following:

WCSU Bid Form – This will contain the costs to provide all of the work shown or called for in the contract documents.

CHRO State Set-Aside Goals Requirements' Worksheet - This worksheet, based on the itemized costs quoted on the WCSU Bid Form, will determine the total contract bid amount that is subject to state set-aside goals.

Checklist Items – All other required documentation must be submitted, as per the "Bid Submission Checklist Form."

F. Bids must be held for a period of 90 calendar days following the date of the bid opening. Following 90 calendar days, if attempted negotiations with the lowest bidder fail to result in a contract, the University reserves the right to re-bid the project.

G. All bidders will verify dimensions and conditions at the site and be responsible for satisfying himself as to all requirements of the contract.

H. All bids will assume that any and all electrical work shall be executed by licensed electricians, in accordance with current codes.

I. Pre-bid Meeting – All contractors are required to visit the site and become familiar with existing conditions. A mandatory pre-bid meeting is scheduled for Thursday December 12, 2019 at 10:30 a.m., beginning at the proposed site across from the Practice Field Parking Lot on Sand Road, located on WCSU's Westside Campus. The agency representative for this project is Daniel L. Casinelli, AIA, LEED AP, Director of Facilities Planning and Engineering; phone no. 203-837-8680.

J. Inquiry Period - Any questions or discrepancies should be submitted in writing by 4:00 p.m., Tuesday, December 17, 2019, to the Dept. of Administrative Services, located on the lower level of University Hall, WCSU,181 White Street, Danbury, CT 06810; Attn: Mark Case; fax no. 203-837-8659; e-mail: casem@wcsu.edu. Responses to any and all inquiries shall be issued via addenda, no later than 4:00 p.m., Tuesday, December 23, 2019. Any and all addenda shall be posted on the DAS contracting portal.

K. Bid Opening – Sealed bids should be submitted to Mr. Mark Case, Director for Administrative Services, University Hall, Lower Level, Western Connecticut State University, 181 White Street, Danbury, CT 06810. Bids should be submitted on or before Tuesday, January 14, 2020. Bids will be opened publicly at the aforementioned time in the Purchasing Office. Bids received after that time will not be accepted. Interested parties are invited to attend. Bidders should submit bids in a sealed envelope with words, "Sealed Bid No. 2020-MC-0002," and the due date. In the event of an unexpected closing by the University at the scheduled bid due date and time (i.e. inclement weather closing), the bid due date shall default to 2:30 p.m. on the next business day the University is open (a business day defined as Monday – Friday, excluding weekends). Closing information can be obtained via the University's website www.wcsu.edu or via the University's weather closing phone line, 203-837-9377.

END

WESTERN CONNECTICUT STATE UNIVERSITY
BID SUBMISSION CHECKLIST FORM

Project: New Restroom Facility – Westside Campus
Bid No.: 2020-MRC-0002

Listed below are the following forms/documentation that must be completed and submitted in the bid package before the official bid opening. Failure to comply may result in the disqualification of the bid submission.

- ☐ WCSU Bid Form
- ☐ DAS – Contractor Prequalification Certificate
- ☐ DAS – Contractor Prequalification Update (Bid) Statement
- ☐ OPM Ethics Form 5 - Consulting Agreement Affidavit
- ☐ OPM Ethics Form 6 – Affirmation of receipt of State Ethics Laws Summary
- ☐ OPM Ethics Form 7 – Iran Certification
- ☐ OPM Nondiscrimination Certification Form C – Affidavit by Entity
- ☐ OPM Nondiscrimination Certification Form D or Form E (as applicable)
- ☐ CHRO Contract Compliance Regulations - Notification to Bidders
- ☐ CHRO State Set-Aside Goals Requirements Pertaining to this Bid/Worksheet
- ☐ CHRO Form of Proposal – Set-Aside Worksheet
- ☐ State Elections Enforcement Commission – SEEC Form 10
- ☐ Bidders Qualification Statement
- ☐ Bid Bond
- ☐ Evidence of Insurance
- ☐ CT Dept. of Labor Contractors Wage Certification Form
- ☐ CT Dept. of Labor Contracting Agency Certification Form

Below are the following forms/documentation that are to be submitted at time of Contract Execution:

- ☐ OPM Ethics Form 1 - Gift and Campaign Contribution Certification
- ☐ Performance Bond
- ☐ Labor and Materials Payment Bond
- ☐ Contractor's proposed construction schedule in format acceptable to the University

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WESTERN CONNECTICUT STATE UNIVERSITY

BID FORM

BIDDER:_____

_____ _____
Address Telephone No.

BID PROPOSAL FOR:

NEW RESTROOMS FACILITY – WESTSIDE CAMPUS
BID NO. 2020-MRC-0002

ADDRESSED TO:

Mr. Mark Case
Director of Administrative Services
Western Connecticut State University, 181 White Street, Danbury, CT 06810

In preparing this Bid, we have carefully examined the Bidding Documents for this Work. We have visited the site and noted the conditions affecting the Work.

The Bidding Documents referred to include Drawings and Specifications prepared by Western Connecticut State University and entitled:

_____

We acknowledge receiving the following Addenda issued by the Architect:

No. 1 dated _____ No. 2 dated _____ No. 3 dated _____ No. 4 dated _____

BASE BID:

We propose to perform the Work described in the Bidding Documents, in keeping with the definitions of Article 1 of the Instructions to Bidders, for the Base Bid Sum of :

_____ $_____
Dollars

TIME OF COMPLETION:

We agree that all work will be completed no later than _____ weeks from issuance of a purchase order or letter of intent.

BID ACCEPTANCE:

We agree that this proposal shall not be withdrawn for a period of ninety calendar days after date of submittal. We understand that Owner reserves the right to accept any Bid, reject any or all Bids, and to waive any informality in the Bidding. At the time of execution of the contract, we shall furnish all required documentation as listed on the Bid Submission Checklist Form.

Firm Name: _____

Address: _____

_____

By: _____ **Title:** _____
(Name Typed)

Signature: _____ **Date:** _____

The Bidder is a/an (individual) (partnership) (corporation). Names and titles of other officers or partners are:

_____

_____

_____

(For corporation, give State of incorporation and affix corporate seal.)

State of Connecticut

Department of Administrative Services

Construction Contractor Prequalification Program

Overview

The Department of Administrative Services (DAS) Construction Contractor Prequalification Program (**C.G.S. 4a-100**) requires all contractors to prequalify before they can bid on a contract or perform work pursuant to a contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or any other public work by the state or a municipality, estimated to cost more than $500,000 and which is funded in whole or in part with state funds, except a public highway or bridge project or any other construction project administered by the Department of Transportation.

Contact

Department of Administrative Services/Procurement Division
Construction Contractor Prequalification Program
450 Columbus Blvd – Suite 1202
Hartford, CT 06103

website: **http://portal.ct.gov/DASprequal**

Ph: (860) 713-5280
Fax: (860) 622-2867

e-mail: **DAS.Prequalification@ct.gov**

STATE OF CONNECTICUT
GIFT AND CAMPAIGN CONTRIBUTION CERTIFICATION

Written or electronic certification to accompany a State contract with a value of $50,000 or more, pursuant to C.G.S. §§ 4-250, 4-252(c) and 9-612(f)(2) and Governor Dannel P. Malloy's Executive Order 49.

INSTRUCTIONS:

Complete all sections of the form. Attach additional pages, if necessary, to provide full disclosure about any lawful campaign contributions made to campaigns of candidates for statewide public office or the General Assembly, as described herein. Sign and date the form, under oath, in the presence of a Commissioner of the Superior Court or Notary Public. Submit the completed form to the awarding State agency at the time of initial contract execution and if there is a change in the information contained in the most recently filed certification, such person shall submit an updated certification either (i) not later than thirty (30) days after the effective date of such change or (ii) upon the submittal of any new bid or proposal for a contract, whichever is earlier. Such person shall also submit an accurate, updated certification not later than fourteen days after the twelve-month anniversary of the most recently filed certification or updated certification.

CHECK ONE: ☐ Initial Certification ☐ 12 Month Anniversary Update (Multi-year contracts only.)

☐ Updated Certification because of change of information contained in the most recently filed certification or twelve-month anniversary update.

GIFT CERTIFICATION:

As used in this certification, the following terms have the meaning set forth below:

1) "Contract" means that contract between the State of Connecticut (and/or one or more of it agencies or instrumentalities) and the Contractor, attached hereto, or as otherwise described by the awarding State agency below;
2) If this is an Initial Certification, "Execution Date" means the date the Contract is fully executed by, and becomes effective between, the parties; if this is a twelve-month anniversary update, "Execution Date" means the date this certification is signed by the Contractor;
3) "Contractor" means the person, firm or corporation named as the contactor below;
4) "Applicable Public Official or State Employee" means any public official or state employee described in C.G.S. §4-252(c)(1)(i) or (ii);
5) **"Gift"** has the same meaning given that term in C.G.S. § 4-250(1);
6) "Principals or Key Personnel" means and refers to those principals and key personnel of the Contractor, and its or their agents, as described in C.G.S. §§ 4-250(5) and 4-252(c)(1)(B) and (C).

I, the undersigned, am a Principal or Key Personnel of the person, firm or corporation authorized to execute this certification on behalf of the Contractor. I hereby certify that, no gifts were made by (A) such person, firm, corporation, (B) any principals and key personnel of the person firm or corporation who participate substantially in preparing bids, proposals or negotiating state contracts or (C) any agent of such, firm, corporation, or principals or key personnel who participates substantially in preparing bids, proposals or negotiating state contracts, to (i) any public official or state employee of the state agency or quasi-public agency soliciting bids or proposals for state contracts who participates substantially in the preparation of bid solicitations or request for proposals for state contracts or the negotiation or award of state contracts or (ii) any public official or state employee of any other state agency, who has supervisory or appointing authority over such state agency or quasi-public agency.

I further certify that no Principals or Key Personnel know of any action by the Contractor to circumvent (or which would result in the circumvention of) the above certification regarding **Gifts** by providing for any other Principals, Key Personnel, officials, or employees of the Contractor, or its or their agents, to make a **Gift** to any Applicable Public Official or State Employee. I further certify that the Contractor made the bid or proposal for the Contract without fraud or collusion with any person.

CAMPAIGN CONTRIBUTION CERTIFICATION:

I further certify that, on or after January 1, 2011, neither the Contractor nor any of its principals, as defined in C.G.S. § 9-612(f)(1), has made any **campaign contributions** to, or solicited any contributions on behalf of, any exploratory committee, candidate committee, political committee, or party committee established by, or supporting or authorized to support, any candidate for statewide public office, in violation of C.G.S. § 9-612(f)(2)(A). I further certify that **all lawful campaign contributions** that have been made on or after January 1, 2011 by the Contractor or any of its principals, as defined in C.G.S. § 9-612(f)(1), to, or solicited on behalf of, any exploratory committee, candidate committee, political committee, or party committee established by, or supporting or authorized to support any candidates for statewide public office or the General Assembly, are listed below:

Lawful Campaign Contributions to Candidates for Statewide Public Office:

Contribution Date	Name of Contributor	Recipient	Value	Description

Lawful Campaign Contributions to Candidates for the General Assembly:

Contribution Date	Name of Contributor	Recipient	Value	Description

Sworn as true to the best of my knowledge and belief, subject to the penalties of false statement.

_____ _____

Printed Contractor Name **Printed Name of Authorized Official**

_____

Signature of Authorized Official

Subscribed and acknowledged before me this _____ day of _____, 20___.

_____

Commissioner of the Superior Court (or Notary Public)

_____

My Commission Expires

STATE OF CONNECTICUT
CONSULTING AGREEMENT AFFIDAVIT

Affidavit to accompany a bid or proposal for the purchase of goods and services with a value of $50,000 or more in a calendar or fiscal year, pursuant to Connecticut General Statutes §§ 4a-81(a) and 4a-81(b). For sole source or no bid contracts the form is submitted at time of contract execution.

INSTRUCTIONS:

If the bidder or vendor has entered into a consulting agreement, as defined by Connecticut General Statutes § 4a-81(b)(1): Complete all sections of the form. If the bidder or contractor has entered into more than one such consulting agreement, use a separate form for each agreement. Sign and date the form in the presence of a Commissioner of the Superior Court or Notary Public. **If the bidder or contractor has not entered into a consulting agreement, as defined by Connecticut General Statutes § 4a-81(b)(1):** Complete only the shaded section of the form. Sign and date the form in the presence of a Commissioner of the Superior Court or Notary Public.

Submit completed form to the awarding State agency with bid or proposal. For a sole source award, submit completed form to the awarding State agency at the time of contract execution.

This affidavit must be amended if there is any change in the information contained in the most recently filed affidavit not later than (i) thirty days after the effective date of any such change or (ii) upon the submittal of any new bid or proposal, whichever is earlier.

AFFIDAVIT: [Number of Affidavits Sworn and Subscribed On This Day: _____]

I, the undersigned, hereby swear that I am a principal or key personnel of the bidder or contractor awarded a contract, as described in Connecticut General Statutes § 4a-81(b), or that I am the individual awarded such a contract who is authorized to execute such contract. I further swear that I have not entered into any consulting agreement in connection with such contract, **except for the agreement listed below**:

_____ _____
Consultant's Name and Title Name of Firm (if applicable)

_____ _____ _____
Start Date End Date Cost

Description of Services Provided: _____

_____

Is the consultant a former State employee or former public official? ☐ YES ☐ NO

If YES: _____ _____
Name of Former State Agency Termination Date of Employment

Sworn as true to the best of my knowledge and belief, subject to the penalties of false statement.

_____ _____ _____
Printed Name of Bidder or Contractor **Signature of Principal or Key Personnel** **Date**

_____ _____
Printed Name (of above) Awarding State Agency

Sworn and subscribed before me on this _____ day of _____, 20___.

_____
Commissioner of the Superior Court or Notary Public

_____
My Commission Expires

STATE OF CONNECTICUT

AFFIRMATION OF RECEIPT OF STATE ETHICS LAWS SUMMARY

Written or electronic affirmation to accompany a large State construction or procurement contract, having a cost of more than $500,000, pursuant to Connecticut General Statutes §§ 1-101mm and 1-101qq

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INSTRUCTIONS:

Complete all sections of the form. Submit completed form to the awarding State agency or contractor, as directed below.

CHECK ONE:

- ☐ I am a person seeking a large State construction or procurement contract. I am submitting this affirmation to the awarding State agency with my bid or proposal. [Check this box if the contract will be awarded through a competitive process.]
- ☐ I am a contractor who has been awarded a large State construction or procurement contract. I am submitting this affirmation to the awarding State agency at the time of contract execution. [Check this box if the contract was a sole source award.]
- ☐ I am a subcontractor or consultant of a contractor who has been awarded a large State construction or procurement contract. I am submitting this affirmation to the contractor.
- ☐ I am a contractor who has already filed an affirmation, but I am updating such affirmation either (i) no later than thirty (30) days after the effective date of any such change or (ii) upon the submittal of any new bid or proposal, whichever is earlier.

IMPORTANT NOTE:

Within fifteen (15) days after the request of such agency, institution or quasi-public agency for such affirmation contractors shall submit the affirmations of their subcontractors and consultants to the awarding State agency. Failure to submit such affirmations in a timely manner shall be cause for termination of the large State construction or procurement contract.

AFFIRMATION:

I, the undersigned person, contractor, subcontractor, consultant, or the duly authorized representative thereof, affirm (1) receipt of the summary of State ethics laws* developed by the Office of State Ethics pursuant to Connecticut General Statutes § 1-81b and (2) that key employees of such person, contractor, subcontractor, or consultant have read and understand the summary and agree to comply with its provisions.

* The summary of State ethics laws is available on the State of Connecticut's Office of State Ethics website.

_____ _____
Signature Date

_____ _____
Printed Name Title

_____
Firm or Corporation (if applicable)

_____ _____ ____ _____
Street Address City State Zip

_____
Awarding State Agency

STATE OF CONNECTICUT

Written or electronic PDF copy of the written certification to accompany a large state contract pursuant to P.A. No. 13-162 (Prohibiting State Contracts With Entities Making Certain Investments In Iran)

Respondent Name: _____

INSTRUCTIONS:

CHECK ONE: ☐ Initial Certification.
☐ Amendment or renewal.

A. Who must complete and submit this form. Effective October 1, 2013, this form must be submitted for any large state contract, as defined in section 4-250 of the Connecticut General Statutes. This form must always be submitted with the bid or proposal, or if there was no bid process, with the resulting contract, regardless of where the principal place of business is located.

Pursuant to P.A. No. 13-162, upon submission of a bid or prior to executing a large state contract, **the certification portion of this form must be completed** by any corporation, general partnership, limited partnership, limited liability partnership, joint venture, nonprofit organization or other business organization **whose principal place of business is located outside of the United States**. United States subsidiaries of foreign corporations are exempt. For purposes of this form, a "foreign corporation" is one that is organized and incorporated outside the United States of America.

Check applicable box:

☐ Respondent's principal place of business is within the United States or Respondent is a United States subsidiary of a foreign corporation. Respondents who check this box **are not required to complete the certification portion of this form**, but must submit this form with its Invitation to Bid ("ITB"), Request for Proposal ("RFP") or contract package if there was no bid process.

☐ Respondent's principal place of business is outside the United States and it is not a United States subsidiary of a foreign corporation. **CERTIFICATION required.** Please complete the certification portion of this form and submit it with the ITB or RFP response or contract package if there was no bid process.

B. Additional definitions.

1) "Large state contract" has the same meaning as defined in section 4–250 of the Connecticut General Statutes;
2) "Respondent" means the person whose name is set forth at the beginning of this form; and
3) "State agency" and "quasi-public agency" have the same meanings as provided in section 1–79 of the Connecticut General Statutes.

C. Certification requirements.

No state agency or quasi-public agency shall enter into any large state contract, or amend or renew any such contract with any Respondent whose principal place of business is located outside the United States and is not a United States subsidiary of a foreign corporation unless the Respondent has submitted this certification.

Complete all sections of this certification and sign and date it, under oath, in the presence of a Commissioner of the Superior Court, a Notary Public or a person authorized to take an oath in another state.

CERTIFICATION:

I, the undersigned, am the official authorized to execute contracts on behalf of the Respondent. I certify that:

☐ Respondent has made no direct investments of twenty million dollars or more in the energy sector of Iran on or after October 1, 2013, as described in Section 202 of the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010.

☐ Respondent has either made direct investments of twenty million dollars or more in the energy sector of Iran on or after October 1, 2013, as described in Section 202 of the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010, or Respondent made such an investment prior to October 1, 2013 and has now increased or renewed such an investment on or after said date, or both.

Sworn as true to the best of my knowledge and belief, subject to the penalties of false statement.

_____ _____
Printed Respondent Name **Printed Name of Authorized Official**

_____
Signature of Authorized Official

Subscribed and acknowledged before me this _____ day of _____, 20___.

_____
Commissioner of the Superior Court (or Notary Public)

_____
My Commission Expires

STATE OF CONNECTICUT

NONDISCRIMINATION CERTIFICATION — Affidavit By Entity For Contracts Valued at $50,000 or More

Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson, member, or other corporate officer duly authorized to adopt corporate, company, or partnership policy that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended

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INSTRUCTIONS:

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at $50,000 or more for any year of the contract. Complete all sections of the form. Sign form in the presence of a Commissioner of Superior Court or Notary Public. Submit to the awarding State agency prior to contract execution.

AFFIDAVIT:

I, the undersigned, am over the age of eighteen (18) and understand and appreciate the obligations of an oath. I am _____ (Signatory's Title) of _____ (Name of Entity), an entity duly formed and existing under the laws of _____ (Name of State or Commonwealth).

I certify that I am authorized to execute and deliver this affidavit on behalf of

_____ (Name of Entity) and that _____ (Name of Entity)

has a policy in place that complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended.

_____
Authorized Signatory

_____
Printed Name

Sworn and subscribed to before me on this _____ day of _____, _____ 20____.

_____ _____
Commissioner of the Superior Court/ Notary Public Commission Expiration Date

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STATE OF CONNECTICUT

NONDISCRIMINATION CERTIFICATION — New Resolution By Entity For Contracts Valued at $50,000 or More

Documentation in the form of a corporate, company, or partnership policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of a contractor that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended.

INSTRUCTIONS:

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at $50,000 or more for any year of the contract. Complete all sections of the form. Submit to the awarding State agency prior to contract execution.

CERTIFICATION OF RESOLUTION:

I, _____ (Authorized Signatory) , _____ (Title) , of _____ (Name of Entity) ,

an entity duly formed and existing under the laws of _____ (Name of State or Commonwealth) ,

certify that the following is a true and correct copy of a resolution adopted on the _____ day of

_____ , 20 _____ , by the governing body of _____ (Name of Entity)

in accordance with all of its documents of governance and management and the laws of

_____ (Name of State or Commonwealth) , and further certify that such resolution has not been modified

or revoked, and is in full force and effect.

RESOLVED: That the policies of _____ (Name of Entity) comply with

nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended.

The undersigned has executed this certificate this _____ day of _____ ,20 _____.

_____ (Authorized Signatory) _____ (Date)

_____ (Printed Name)

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STATE OF CONNECTICUT

NONDISCRIMINATION CERTIFICATION — Prior Resolution By Entity For Contracts Valued at $50,000 or More

Documentation in the form of a corporate, company, or partnership policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of a contractor that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended

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INSTRUCTIONS:

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at $50,000 or more for any year of the contract. Complete all sections of the form. Attach copy of previously adopted resolution (*State of CT, Nondiscrimination Certification, Form D: New Resolution*). Submit all documentation to the awarding State agency prior to contract execution.

CERTIFICATION OF PRIOR RESOLUTION:

I, the undersigned, am a duly authorized corporate officer or member of _____.
Name of Entity

I have reviewed the attached prior resolution. I certify that:

(1) the attached prior resolution complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended; and

(2) the prior resolution remains in full force and effect on the date this documentation is submitted to the awarding State agency.

Authorized Signatory _____ Title _____

Printed Name _____ Date _____

RESERVED FOR STATE USE

I, the undersigned head of the awarding State agency, or designee, certify that the attached prior resolution complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60 and 4a-60a, as amended.

Signature of Agency Head (or designee) _____ Date _____

Awarding State Agency _____

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Tanya A. Hughes
Executive Director

The Commission
How to File a Discrimination Complaint
Affirmative Action
Contract Compliance
Legal
Public Hearings
Whistleblower Retaliation
Martin Luther King, Jr. Holiday Commission
Legislative and Media Inquiries
Speaker's Bureau
Volunteer Mediators and Attorneys
Internship Opportunities
User Satisfaction Survey

Contract Compliance

Connecticut state government spends well in excess of one billion dollars each year to purchase supplies, legal, medical and other professional services, and public works contracting services. Those who have contracts with the state to provide these services bear a special responsibility to assure that their employment and subcontracting procedures promote equal opportunity for all persons. Contract compliance laws were enacted as a means of providing equal employment opportunities for minorities and female workers and economic development and business growth opportunities for small contractors and minority and women owned businesses through the distribution of state contracting dollars.

The Connecticut Commission on Human Rights and Opportunities has the responsibility to review, monitor and enforce the equal opportunity, affirmative action and contract compliance laws of the state as they apply to contractors (including subcontractors and suppliers to contractors) who do business with the state.

Contract Compliance Law in Connecticut

There are two key contract compliance laws in Connecticut; the contract compliance law and the small contractors set-aside program. They apply to state agencies and to political subdivisions of the state other than municipalities. Examples of political subdivisions of the state include regional transit districts, regional planning agencies, councils of governments and other such quasi public agencies, as well as all agencies of the state.

- The ***contract compliance law***, enacted as **Conn. Gen. Stat. Section 4a-60**, and the administrative regulations issued pursuant thereto prohibit all those who contract with the state, including subcontractors, from engaging in or permitting discrimination in recruiting, hiring or other employment practices. The law further requires state agencies to aggressively solicit the participation of minority and women owned businesses in state contracts.

- The agencies covered by the law must report all their contracts valued in excess of $3,000 to CHRO and provide CHRO information necessary to assess their compliance with the law.

- There is a subset of the contract compliance law that pertains to construction related contracts. It places specific contract compliance responsibilities on **public works contracts.** These are agreements for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property. Link to these statutes (beginning with section 46a-68b through 46a-68k) :

- The ***small contractors set-aside program*** requires each state agency and political subdivision of the state other than a municipality to set as an annual goal their intention to contract with certified small contractors at least 25% of their total projected annual expenditures . The law further requires that one quarter of this amount (or 6.25% of the total projected annual expenditures) be with certified minority businesses. Thus agencies may set aside contracts in whole or in part for bid only by eligible small and/or minority businesses. Link to small contractor program statute and link to small contractor program policy guidelines and goal setting procedures.
- A small contractor is a company that has been in business for at least one year, has its principal place of business in Connecticut and whose gross revenues for the prior year did not exceed 10 million dollars. As of January 1, 2008 this ceiling will increase to 15 million dollars.
- A minority business is a small contractor that is 51% owned, controlled and beneficially operated by a minority person or persons. The law defines a minority person as a person with a disability, or as any person who is:
  -*a Black American*, including a person having origins in any of the Black African racial groups;
  -*a Hispanic American,* including a person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin;
  -*an American Indian* and a person having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification;
  -*an Asian Pacific American* and Pacific islander;
  -a person having origins in the *Iberian Peninsula, including Portugal*; or
  -*a women*.

The Department of Administrative Services is responsible for certifying businesses as small and small minority owned businesses. Certification is for a two year period and is renewable. For more information about this process, or to download the forms necessary to be certified or re-certified, link to: DAS Certification

To review the list of certified small and minority businesses link to:

For Contract Compliance Forms and Reports link here.

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25 Sigourney Street, Hartford, Connecticut 06106 / Phone: 860-541-3400

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS
(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4)Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

(a) the bidder's success in implementing an affirmative action plan;
(b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
(c) the bidder's promise to develop and implement a successful affirmative action plan;
(d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
(e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder's good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) Definition of Small Contractor

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving o f written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category.

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

White (not of Hispanic Origin)-All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East. Black (not of Hispanic Origin)-All persons having origins in any of the Black racial groups of Africa. Hispanic- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.	Asian or Pacific Islander- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa. American Indian or Alaskan Native- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART 1 – Bidder Information

Company Name: Street Address: City & State: Chief Executive:	Bidder Federal Employer Identification Number: Or Social Security Number:
Major Business Activity: (brief description)	Bidder Identification (response optional/definitions on page 1) -Bidder is a small contractor? Yes ☐ No ☐ -Bidder is a minority business enterprise? Yes ☐ No ☐ (If yes, check ownership category) Black ☐ Hispanic ☐ Asian American ☐ American Indian/Alaskan Native ☐ Iberian Peninsula ☐ Individual(s) with a Physical Disability ☐ Female ☐ -Bidder is certified as above by State of CT? Yes ☐ No ☐
Bidder Parent Company: (If any)	
Other Locations in CT: (If any)	

PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ☐ No ☐	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ☐ No ☐
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ☐ No ☐	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ☐ No ☐
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ☐ No ☐	9. Does your company have a mandatory retirement age for all employees? Yes ☐ No ☐
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ☐ No ☐	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ☐ No ☐ N/A ☐
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ☐ No ☐	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ☐ No ☐ N/A ☐
6. Does your company have a collective bargaining agreement with workers? Yes ☐ No ☐ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ☐ No ☐ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of CT? Yes ☐ No ☐	12. Does your company have a written affirmative action Plan? Yes ☐ No ☐ If no, please explain. 13. Is there a person in your company who is responsible for equal employment opportunity? Yes ☐ No ☐ If yes, give name and phone number:

1. Will the work of this contract include subcontractors or suppliers? Yes ☐ No ☐

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above? Yes ☐ No ☐

PART IV - Bidder Employment Information Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification (X)		3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source			
State Employment Service	☐	☐			Work Experience	
Private Employment Agencies	☐	☐			Ability to Speak or Write English	
Schools and Colleges	☐	☐			Written Tests	
Newspaper Advertisement	☐	☐			High School Diploma	
Walk Ins	☐	☐			College Degree	
Present Employees	☐	☐			Union Membership	
Labor Organizations	☐	☐			Personal Recommendation	
Minority/Community Organizations	☐	☐			Height or Weight	
Others (please identify)	☐	☐			Car Ownership	
	☐	☐			Arrest Record	
	☐	☐			Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)

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WESTERN CONNECTICUT STATE UNIVERSITY

NOTICE OF CHANGES TO THE
THE CONNECTICUT COMMISSION ON HUMAN RIGHTS & OPPORTUNITIES
SELF-PERFORMANCE & SUB-CONTRACTING REQUIREMENTS
FOR THE SUPPLIER DIVERSITY (SET-ASIDE SBE/MBE) PROGRAM

The contractor who is selected to perform this state project must file and receive an approved Affirmative Action Plan by the Commission of Human Rights and Opportunities. This project is subject to the State Set-Aside goals and new self- performance and subcontracting requirements.

The contractor selected to perform this state project needs to solicit multiple bids per subcontract (class of work) from an assorted variety of subcontractors, non-trade related service providers, ethnic minority, woman, certified by State of CT. Dept. of Administrative Services Supplier Diversity (Set-Aside) Program.

Please note the following **NEW STATUTORY CHANGES TO** 4a-60g, effective October 1, 2013 as it relates to **Self-Performance & Subcontracting Requirements**

P. A. 13-304 increases the percentages of work required to be performed by any prime SBE/MBE company that is awarded a contract under the set-aside statutes. Previously, a company awarded a set-aside contract was required to self-perform at least 15% of such contract; it will now be required to self-perform at least 30%. Further, SBEs and MBEs that subcontract some of the work under their set-aside contracts will be required to subcontract at least 50% of the remaining work (i.e. the work not self-performed by the prime) to SBEs and MBEs, respectively, instead of 25%, under current law. Please note that the 50% requirement applies to the work subcontracted; in other words, the percentage to be self-performed by the prime contractor cannot be used to accomplish the 50% requirement.

- Example: If an SBE is awarded a $100,000 state contract under the set-aside statutes, that SBE will be required to perform at least $30,000 of the work under the contract with its own workforce. If the SBE self-performs $30,000 of the work, and chooses to subcontract the remainder, the SBE must subcontract at least $35,000 of the work to another certified SBE (50% of the remaining $70,000 on the contract).

The CHRO Form of Proposal Set-Aside Worksheet must be submitted with the bid package.

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Form of Proposal Bid # 2018-MRC-

Set Aside Worksheet

	Subcontractor Name	Class of work	SBE	MBE	Prime Contractor self performing $$	Subcontract amounts
1					$	
2						$
3						$
4						$
5						$
6						$
7						$
8						$
9	Prime Contractor Total				0	
10	SBE Subtotal	Add SBE subcontract amounts from above list and enter total at right				$
11	MBE/WBE Subtotal	Add MBE/WBE subcontract amounts from the list and enter total to the right				$
12	Lump Sum base bid	Enter total lump sum base bid from bid submittal form				$
13	SBE Percentage	Divide line 10 by line 12. Enter % to the right				%
14	MBE/WBE Percentage	Divide line 11 by line 12. Enter % to the right.				%

In determining and ensuring compliance with CHRO requirements this worksheet must be submitted as part of the bid submittal package. Failure to do so may be grounds for disqualification of the bid. Compliance determination shall initially be based on the base bid sum. However, for bid solicitations requiring acceptance of Alternates or Supplemental bids, a revised worksheet shall be required prior to issuance of contract.
Small Business Set Aside requirements for this project: Minimum 25% of total lump sum to certified SBE's with at least one quarter (1/4) of THAT amount to certified MBE's.

The MBE requirement is still 6.25% of the entire bid total.

Each bidder shall submit, as part of their proposal, copies of Certificates of Eligibility for each set aside subcontractor or "screen shots" from the State of Connecticut Supplier Diversity web site for each set aside subcontractor showing name and address, certification type and certificate expiration date.

Vendor Company Name _____

Authorized signature_____ Date_____

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STATE OF CONNECTICUT
COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES

NOTICE CONCERNING CONTRACT COMPLIANCE RESPONSIBILITIES

TO ALL LABOR UNIONS, WORKERS REPRESENTATIVES AND VENDORS:

Any contract this contractor has with the State of Connecticut or political subdivisions of the state, other than municipalities, shall be performed in accordance with CONN. GEN. STAT. Section 4a-60 and Section 4a-60a.

This means that this contractor:

1. Agrees to provide the Commission on Human Rights and Opportunities (CHRO) with any information concerning this contractor's employment practices and procedures which relates to the Commission's responsibilities under CONN. GEN. STAT. Sections 4a-60 or 46a-56 or Section 4a-60a.; and

2. Agrees to include the provisions of CONN. GEN. STAT. Section 46a-60(a) and Section 4a-60a in each and every subcontract and purchase order and to take whatever action the CHRO deems necessary to enforce these provisions.

WITH REGARD TO RACE, COLOR, RELIGIOUS CREED, AGE, MARITAL STATUS, NATIONAL ORIGIN, ANCESTRY, SEX, MENTAL RETARDATION OR PHYSICAL DISABILITY, this means that this contractor:

1. Shall not discriminate or permit discrimination against anyone;

2. Shall take affirmative action so that persons applying for employment are hired on the basis of job-related qualifications and that employees once hired are treated without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation or physical disability, unless the contractor can show that the disability prevents performance of the work involved;

3. Shall state in all advertisements for employees that it is an affirmative action-equal opportunity employer;

4. Shall comply with CONN. GEN. STAT. Sections 4a-60, 46a-68e and 46a-68f and with each regulation or relevant order issued by the CHRO under CONN. GEN. STAT. Sections 46a-56, 46a-68e and
46a-68f; and

5. Shall make, if the contract is a public works contract, good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials.

WITH REGARD TO SEXUAL ORIENTATION, GENDER IDENTITY OR EXPRESSION:

1. The contractor will not discriminate or permit discrimination against anyone, and employees will be treated without regard to their sexual orientation, gender identity or expression once employed; and

2. The contractor agrees to fully comply with Section 4a-60a and each regulation or relevant order issued by the CHRO under CONN. GEN. STAT. Section 46a-56.

Persons having questions about this notice or their rights under the law are urged to contact the:

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
AFFIRMATIVE ACTION AND CONTRACT COMPLIANCE
UNIT

450 Columbus Boulevard, Suite 2
Hartford, CT 06103
(860) 541-4709

COPIES OF THIS NOTICE SHALL BE POSTED IN CONSPICUOUS PLACES AVAILABLE TO ALL EMPLOYEES AND APPLICANTS FOR EMPLOYMENT

Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations

Acknowledgement of Receipt of Explanation of Prohibitions for Incorporation in Contracting and Bidding Documents

This notice is provided under the authority of Connecticut General Statutes §9-612(g)(2), as amended by P.A. 10-1, and is for the purpose of informing state contractors and prospective state contractors of the following law (italicized words are defined on the reverse side of this page).

CAMPAIGN CONTRIBUTION AND SOLICITATION LIMITATIONS

No *state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor*, with regard to a *state contract* or *state contract solicitation* with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee (which includes town committees).

In addition, no holder or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of State senator or State representative, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

On and after January 1, 2011, no state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor, with regard to a state contract or state contract solicitation with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall **knowingly** *solicit* contributions from the state contractor's or prospective state contractor's employees or from a *subcontractor* or *principals of the subcontractor* on behalf of (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

DUTY TO INFORM

State contractors and prospective state contractors are required to inform their principals of the above prohibitions, as applicable, and the possible penalties and other consequences of any violation thereof.

PENALTIES FOR VIOLATIONS

Contributions or solicitations of contributions made in violation of the above prohibitions may result in the following civil and criminal penalties:

Civil penalties—Up to $2,000 or twice the amount of the prohibited contribution, whichever is greater, against a principal or a contractor. Any state contractor or prospective state contractor which fails to make reasonable efforts to comply with the provisions requiring notice to its principals of these prohibitions and the possible consequences of their violations may also be subject to civil penalties of up to $2,000 or twice the amount of the prohibited contributions made by their principals.

Criminal penalties—Any knowing and willful violation of the prohibition is a Class D felony, which may subject the violator to imprisonment of not more than 5 years, or not more than $5,000 in fines, or both.

CONTRACT CONSEQUENCES

In the case of a state contractor, contributions made or solicited in violation of the above prohibitions may resulting the contract being voided.

In the case of a prospective state contractor, contributions made or solicited in violation of the above prohibitions shall result in the contract described in the state contract solicitation not being awarded to the prospective state contractor, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

The State shall not award any other state contract to anyone found in violation of the above prohibitions for a period of one year after the election for which such contribution is made or solicited, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

DEFINITIONS

"State contractor" means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. "State contractor" does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Prospective state contractor" means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. "Prospective state contractor" does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Principal of a state contractor or prospective state contractor" means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization**,** (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has *managerial or discretionary responsibilities with respect to a state contract,* (v) the spouse or a *dependent child* who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

"State contract" means an agreement or contract with the state or any state agency or any quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination or series of such agreements or contracts having a value of one hundred thousand dollars or more in a calendar year, for (i) the rendition of services, (ii) the furnishing of any goods, material, supplies, equipment or any items of any kind, (iii) the construction, alteration or repair of any public building or public work, (iv) the acquisition, sale or lease of any land or building, (v) a licensing arrangement, or (vi) a grant, loan or loan guarantee. "State contract" does not include any agreement or contract with the state, any state agency or any quasi-public agency that is exclusively federally funded, an education loan, a loan to an individual for other than commercial purposes or any agreement or contract between the state or any state agency and the United States Department of the Navy or the United States Department of Defense.

"State contract solicitation" means a request by a state agency or quasi-public agency, in whatever form issued, including, but not limited to, an invitation to bid, request for proposals, request for information or request for quotes, inviting bids, quotes or other types of submittals, through a competitive procurement process or another process authorized by law waiving competitive procurement.

"Managerial or discretionary responsibilities with respect to a state contract" means having direct, extensive and substantive responsibilities with respect to the negotiation of the state contract and not peripheral, clerical or ministerial responsibilities.

"Dependent child" means a child residing in an individual's household who may legally be claimed as a dependent on the federal income tax of such individual.

"Solicit" means (A) requesting that a contribution be made, (B) participating in any fund-raising activities for a candidate committee, exploratory committee, political committee or party committee, including, but not limited to, forwarding tickets to potential contributors, receiving contributions for transmission to any such committee or bundling contributions, (C) serving as chairperson, treasurer or deputy treasurer of any such committee, or (D) establishing a political committee for the sole purpose of soliciting or receiving contributions for any committee. Solicit does not include: (i) making a contribution that is otherwise permitted by Chapter 155 of the Connecticut General Statutes; (ii) informing any person of a position taken by a candidate for public office or a public official, (iii) notifying the person of any activities of, or contact information for, any candidate for public office; or (iv) serving as a member in any party committee or as an officer of such committee that is not otherwise prohibited in this section.

"Subcontractor" means any person, business entity or nonprofit organization that contracts to perform part or all of the obligations of a state contractor's state contract. Such person, business entity or nonprofit organization shall be deemed to be a subcontractor until December thirty first of the year in which the subcontract terminates. "Subcontractor" does not include (i) a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or (ii) an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Principal of a subcontractor" means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a subcontractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a subcontractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a subcontractor, which is not a business entity, or if a subcontractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any subcontractor who has managerial or discretionary responsibilities with respect to a subcontract with a state contractor, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the subcontractor.

ACKNOWLEDGEMENT OF RECEIPT

SIGNATURE

DATE (mm/dd/yyyy)

NAME OF SIGNER

First Name	MI	Last Name	Suffix

TITLE

COMPANY NAME

Additional information may be found on the website of the State Elections Enforcement Commission,
www.ct.gov/seec
Click on the link to "Lobbyist/Contractor Limitations"

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GENERAL CONTRACTOR
BIDDERS QUALIFICATION STATEMENT

PROJECT NAME/NO.: **Western Connecticut State University**
New Restrooms Facility/ BI-RD 306 /2020-MRC-0002

All bidders are required to file this form, properly completed, WITH THEIR PROPOSAL. Failure of a bidder to answer any question or provide required information may be grounds for the awarding authority to disqualify and reject their bid. if a question or request for information does not pertain to your organization in any way, use the symbol "NA" (Not Applicable). Use additional 8 ½" x ll" sheets with your letterhead as necessary.

1. Indicate exactly the name by which this organization is known:

   Name: _____

2. How many years has this organization been in business under its present business name?

   Years: _____

3. How many years has this organization been in business as a General Contractor?

   Years: _____

4. If this organization has not always been a General Contractor, list the trade(s) that your firm customarily performed prior to the time that you became a General Contractor:

   4.1 _____

   4.2 _____

   4.3 _____

5. Indicate all other names by which this organization has been known and the length of time known by each name:

   5.1 _____

   5.2 _____

   5.3 _____

6. This firm is a:

Corporation	☐
Partnership	☐
Sole Proprietorship	☐
Joint Venture	☐
Other	_____

7. Attach resumes of all supervisory personnel, such as Principals, Project Managers, and Superintendents, who will be directly involved with project on which you are now a bidder. Indicate the number of years of construction experience and number of years of which they were in a Supervisory capacity.

8. List all sub-trades which your firm customarily performs with own employees.

   8.1 _____

   8.2 _____

   8.3 _____

   8.4 _____

   8.5 _____

9. **Trade References:** Names, addresses and telephone numbers of several firms with whom your organization has regular business dealings, (attach separate sheets as necessary):

10. All Construction Projects your organization has in process (attach separate sheets using the following format as necessary):

10.1 Specific Title & Location: _____

10.2 Contract Amount: _____

10.3 Description of your scope of work performed . _____

10.4 Owner: _____

10.5 Designer: _____

10.6 Start Date: _____

10.7 Finish Date: _____

*__10.8__ Any Complaint on Quality or Management _____

10.9 Owners Representative: _____ _____
(Name) Telephone Number

***Please Attach A Separate Sheet Explaining Any Negative Entry In This Row.**

11 All Construction Projects your organization has completed in the past five years or the twenty projects most recently completed (attach separate sheets using the following format as necessary):

11.1 Specific Title & Location: _____

11.2 Contract Amount: _____

11.3 Description of your scope of work performed . _____

11.4 Owner: _____

11.5 Designer: _____

11.6 Start Date: _____

11.7 Finish Date: _____

*__11.8__ Any Complaint on Quality or Management _____

11.9 Owners Representative: _____ _____
(Name) Telephone Number

***Please Attach A Separate Sheet Explaining Any Negative Entry In This Row.**

12. Has your organization ever failed to complete a contract, or has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a contract? If so, indicate the circumstances leading to the project failure and the name of the company which provided the bonding for the failed contract(s):

13. List all legal or administrative proceedings currently pending or concluded adversely within the last five years which relate to procurement or performance of any public or private construction contracts. (Exclude OSHA violations which are called for elsewhere in this statement).

13.1 Attached: ☐

13.2 N/A: ☐

14. List all willful or serious violations of any Occupational Safety and Health Act (OSHA) or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any State Occupational Safety and Health Act or Occupational Safety and Health Act of 1970. Indicate whether these were abated within the time fixed by the citation or whether the citation was appealed. If appealed what is the status or disposition.

14.1

14.2

15. Has your organization had any criminal convictions related to the injury or death of any employee in the three year period preceding the bid. Please list any such convictions below.

15.1

15.2

15.3

Dated at _____

Signed this _____ day of _____ 19 _____

Name of Organization: _____

_____

_____

Signature _____

(Print Name) _____

Title _____

Notary Statement:

Mr./Mrs./Ms. _____ being duly sworn

deposes and says that he/she is the _____ of
(Position or Title)

_____ , and that the answers to the foregoing
(Firm Name)

questions and all statements therein contained are true and correct.

Subscribed and sworn before me this _____ day of _____ 19 _____

Notary Public _____

My Commission Expires _____ 19 _____

END OF SECTION

12. Has your organization ever failed to complete a contract, or has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a contract? If so, indicate the circumstances leading to the project failure and the name of the company which provided the bonding for the failed contract(s):

_____

_____

_____

13. List all legal or administrative proceedings currently pending or concluded adversely within the last five years which relate to procurement or performance of any public or private construction contracts. (Exclude OSHA violations which are called for elsewhere in this statement).

13.1 Attached: ☐

13.2 N/A: ☐

14. List all willful or serious violations of any Occupational Safety and Health Act (OSHA) or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any State Occupational Safety and Health Act or Occupational Safety and Health Act of 1970. Indicate whether these were abated within the time fixed by the citation or whether the citation was appealed. If appealed what is the status or disposition.

14.1

14.2

15. Has your organization had any criminal convictions related to the injury or death of any employee in the three year period preceding the bid. Please list any such convictions below.

15.1

15.2

15.3

Dated at _____

Signed this _____ day of _____ 19 _____

Name of Organization: _____

_____

_____

Signature _____

(Print Name) _____

Title _____

Notary Statement:

Mr./Mrs./Ms. _____ being duly sworn

deposes and says that he/she is the _____ of
(Position or Title)

_____ , and that the answers to the foregoing
(Firm Name)

questions and all statements therein contained are true and correct.

Subscribed and sworn before me this _____ day of _____ 19 _____

Notary Public _____

My Commission Expires _____ 19 _____

END OF SECTION

Minimum Rates and Classifications for Building Construction

Connecticut Department of Labor
Wage and Workplace Standards Division

ID# : B 26746

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: Project Town: Danbury
State# FAP#:

Project: Westside Campus Restrooms Project No: BI-RD-306 Bid No: 2020-MRC-0002

CLASSIFICATION	Hourly Rate	Benefits
1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, & finishes to all types of mechanical systems; application of firestopping material for wall openings & penetrations in walls, floors, ceilings	38.25	27.96
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	40.21	30.99

As of: **Monday, November 25, 2019**

2) Boilermaker	38.34	26.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	34.72	32.55 + a
3b) Tile Setter	34.90	25.87
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.70	21.75
3e) Plasterer	33.48	32.06

As of: **Monday, November 25, 2019**

------LABORERS------

4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	30.75	20.84
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	31.00	20.84
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	31.25	20.84
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.	31.75	20.84
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	31.50	20.84

As of: **Monday, November 25, 2019**

4e) Group 6: Blasters, nuclear and toxic waste removal.	33.75	20.84
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	31.75	20.84
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	29.03	20.84
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	28.49	20.84
4i) Group 10: Traffic Control Signalman	18.00	20.84
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Vinyl Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	33.53	25.66

As of: **Monday, November 25, 2019**

5a) Millwrights	34.04	26.09
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	39.62	27.25+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	53.37	33.705+a+b
-----LINE CONSTRUCTION----		
Groundman	26.50	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00

As of: **Monday, November 25, 2019**

8) Glazier (Trade License required: FG-1,2)	38.18	21.80 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77
----OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	40.97	24.80 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	40.64	24.80 + a
Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	39.88	24.80 + a

As of: **Monday, November 25, 2019**

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	39.48	24.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	38.87	24.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	38.87	24.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	38.55	24.80 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrell).	38.20	24.80 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	37.79	24.80 + a

As of: **Monday, November 25, 2019**

Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	37.34	24.80 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	35.24	24.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	35.24	24.80 + a
Group 12: Wellpoint operator.	35.18	24.80 + a
Group 13: Compressor battery operator.	34.58	24.80 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	33.41	24.80 + a

As of: **Monday, November 25, 2019**

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler.	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	34.26	24.80 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	34.62	21.80

As of: **Monday, November 25, 2019**

10b) Taping Only/Drywall Finishing	35.37	21.80
10c) Paperhanger and Red Label	35.12	21.80
10e) Blast and Spray	37.62	21.80
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	43.62	32.06
12) Well Digger, Pile Testing Machine	37.26	24.05 + a
Roofer: Cole Tar Pitch	41.50	17.00 + a

As of: **Monday, November 25, 2019**

Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing	40.00	17.00 + a
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	44.74	42.48
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	43.62	32.06
------TRUCK DRIVERS------		
17a) 2 Axle	29.51	24.52 + a
17b) 3 Axle, 2 Axle Ready Mix	29.62	24.52 + a

As of: **Monday, November 25, 2019**

17c) 3 Axle Ready Mix	29.67	24.52 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	29.72	24.52 + a
17e) 4 Axle Ready Mix	29.77	24.52 + a
17f) Heavy Duty Trailer (40 Tons and Over)	29.98	24.52 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	29.77	24.52 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	45.57	24.33 + a

As of: **Monday, November 25, 2019**

19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of: **Monday, November 25, 2019**

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: **Monday, November 25, 2019**

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THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

If you have QUESTIONS regarding your wages
CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine
Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007,* where the total cost of all work to be performed is at least $100,000)

(1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);

(2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;

(3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least $100,000;

(4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;

(5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

(6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;

(7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;

(8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;

(9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

(10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;

(11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;

(12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;

(13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;

(14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and

(15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.

(16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTMATELY ARISE CONCERNIG THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice

To All Mason Contractors and Interested Parties Regarding Construction Pursuant to Section 31-53 of the Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

STATUTE 31-55a

- SPECIAL NOTICE -

To: All State and Political Subdivisions,Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the ***contractor's*** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.

- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

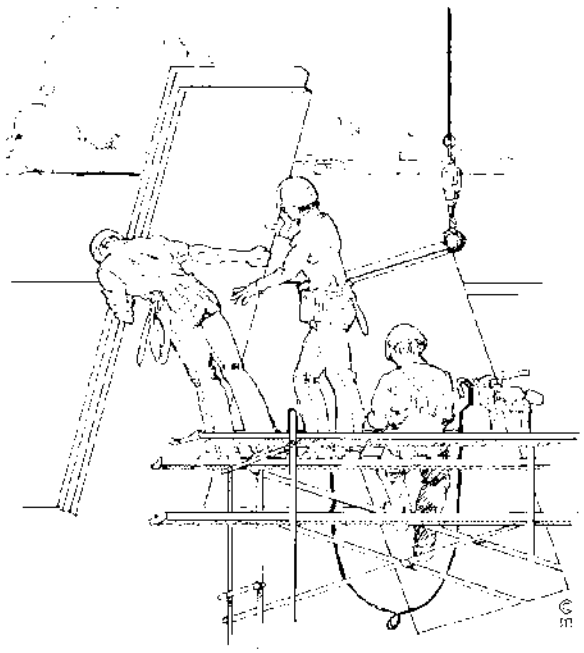
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached "Contracting Agency Certification Form" to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

✎ Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with

_____, located at _____,
project name and number address

shall be $_____, which includes all work, regardless of whether such project

consists of one or more contracts.

CONTRACTOR INFORMATION

Name:_____

Address:_____
Authorized Representative:_____
Approximate Starting Date: _____

Approximate Completion Date:_____

_____ _____
Signature Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

Construction Manager at Risk/General Contractor/Prime Contractor

I,_____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

_____
Street

_____
City

and all of its subcontractors will pay all workers on the

_____
Project Name and Number

_____
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

_____
Signed

Subscribed and sworn to before me this _____ day of _____,_____.

_____
Notary Public

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

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[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

In accordance with Connecticut General Statutes, 31-53
Certified Payrolls with a statement of compliance
shall be submitted monthly to the contracting agency.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

CONTRACTOR NAME AND ADDRESS:

SUBCONTRACTOR NAME & ADDRESS

WORKER'S COMPENSATION INSURANCE CARRIER

POLICY #

EFFECTIVE DATE:
EXPIRATION DATE:

PAYROLL NUMBER | Week-Ending Date | PROJECT NAME & ADDRESS

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE S	M	T	W	TH	F	S	Total ST Hours Total O/T Hours	BASE HOURLY RATE TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				HOURS WORKED EACH DAY								$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							

12/9/2013
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER _____OF

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

1) Medical or hospital care _____ 4) Disability_____

2) Pension or retirement _____ 5) Vacation, holiday_____

3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____of _____, (hereafter known as

Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

a) The records submitted are true and accurate;

b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;

c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);

d) Each such person is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;

e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and

f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

_____ _____ _____

(Signature) (Title) Submitted on (Date)

*****THIS IS A PUBLIC DOCUMENT*****
*****DO NOT INCLUDE SOCIAL SECURITY NUMBERS*****

Weekly Payroll Certification For Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Week-Ending Date:
Contractor or Subcontractor Business Name:

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE S	M	T	W	TH	F	S	Total ST Hours Total O/T Hours	BASE HOURLY RATE TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				HOURS WORKED EACH DAY																
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							

*IF REQUIRED

12/9/2013
WWS-CP2

NOTICE: THIS PAGE MUST BE ACCOMPANIED BY A COVER PAGE (FORM # WWS-CP1)

Information Bulletin
Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine *"job classification"* on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- ***ASBESTOS WORKERS***

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- ***ASBESTOS INSULATOR***

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- ***BOILERMAKERS***

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- ***BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS***

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- ***<u>CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS</u>***

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

• The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

• If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages <u>are not required</u>. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

• An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- ***<u>ELECTRICIANS</u>***

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- ***ELEVATOR CONSTRUCTORS***

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. ****License required by Connecticut General Statutes: R-1,2,5,6.***

- ***FORK LIFT OPERATOR***

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- ***GLAZIERS***

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- ***IRONWORKERS***

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- ***INSULATOR***

• Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- ***LABORERS***

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- ***PAINTERS***

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- ***LEAD PAINT REMOVAL***

• Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

• Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- ***PLUMBERS AND PIPEFITTERS***

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- ***POWER EQUIPMENT OPERATORS***

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- ***ROOFERS***

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- ***SHEETMETAL WORKERS***

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- ***SPRINKLER FITTERS***

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ****License required per Connecticut General Statutes: F-1,2,3,4.***

- ***TILE MARBLE AND TERRAZZO FINISHERS***

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

• Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
• Hauling material off site is not covered provided they are not dumping it at a location outlined above.
• Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➢ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

⇨ Please Note: If the "Benefits" listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the "Benefits" section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

CT DAS PROCUREMENT SERVICES
NOTICE TO BIDDERS
ON BEHALF OF
CT DEPARTMENT OF CONSTRUCTION SERVICES

ARTICLE 1 BIDS AND REJECTION OF BIDS:

1.1 Bids shall be for the complete work as specified and shall include the names of any subcontractors for the four classes of work specified in subsection (a) of C.G.S. § 4b-93 as revised, and for each other class of work for which the awarding authority has required a separate section pursuant to said subsection and the dollar amounts of their subcontracts, and the contractor shall be selected on the basis of such bids. It shall be presumed that the bidder intends to perform with its own employees all work in such four classes and such other classes, for which no subcontractor is named. The bidder's qualifications for performing such work shall be subject to review under C.G.S. § 4b-92, as revised. **For projects estimated to exceed Five Hundred Thousand Dollars ($500,000.00) in total cost, the bidder must be prequalified by the Department of Administrative Services in the classification specified in the Invitation to Bid.**

1.2 The awarding authority may require the contractor to replace a **Named Subcontractor** whenever the awarding authority determines in their sole discretion that such **replacement** is in the **best interest of the State.**

1.3 Every **bid** which is conditional or obscure, **or which is not accompanied by a Department of Administrative Services Prequalification Certificate and Update Statement,** or which contains any addition not called for, shall be invalid, and the awarding authority shall *reject* every such bid. The awarding authority shall be authorized to waive **minor irregularities** which he considers in the best interest of the State, provided the reasons for any such waiver are stated in writing by the awarding authority and made a part of the contract file. No such bid shall be rejected because of the failure to submit prices for, or information relating to, any item or items for which no specific space is provided in the bid form furnished by the awarding authority, but this sentence shall not be applicable to any failure to furnish prices or information required by C.G.S. § 4b-95, as revised, to be furnished in the bid form provided by the awarding authority.

No person who's **Subcontract** exceeds five hundred thousand dollars in value may perform work as a Subcontractor on a project *estimated* to cost more than five hundred thousand dollars, unless the person is **prequalified** in accordance with C.G.S. § 4a-100, as amended by **Public Act 06-134**.

1.4 Projects That Exceed Threshold Limits C.G.S §29-276b:

Projects designated in **Section 00 41 00, Bid Proposal Form** as "Exceeding the Threshold Limits" must meet **C.G.S §20-341gg Registration of Major Contractors:**

Any person engaged in the business of construction, structural repair, structural alteration, dismantling or demolition of a structure or addition that exceeds the threshold limits provided in C.G.S §29-276b, or any person who, under the direction of a general contractor, performs or offers to perform any work that impacts upon the structural integrity of a structure or addition, including repair, alteration, dismantling or demolition of a structure or addition that exceeds the threshold limits shall engage in or offer to perform the work of a Major Contractor unless such person has first obtained a license or certificate of registration from the Department of Consumer Protection. Individuals must be licensed under the requirements of **C.G.S §20-341gg "Registration of Major Contractors"**. The Department of Consumer Protection shall issue a certificate of registration to any person who is prequalified pursuant to section 4a-100 who applies for registration in accordance with this section.

The contractor and all subcontractors that engage in work that impacts upon the structural integrity of a structure or addition must register as a **Major Contractor** with the Department Of Consumer Protection and obtain a **Major Contractor** License issued by the Department Of Consumer Protection prior to Bid Due Date/Time of this Project.

For further information visit the Department Of Consumer Protection Website: **www.dcp.state.ct.us**

1.5 **Bids** shall be publicly opened and read by the awarding authority forthwith. The awarding authority *may* require in the bid form that the contractor agree to perform a stated, minimum percentage of work with its **own forces**. The awarding authority *may* also require the contractor to set aside a portion of the contract for subcontractors who are eligible for **set-aside contracts**. The awarding authority shall not permit **substitution** of a subcontractor for one named in accordance with the provisions of said C.G.S. § 4b-95 or **substitution** of a subcontractor for any designated sub-trade work bid to be performed by the contractor's own forces, *except* for **good cause**. The term "good cause" includes but is not limited to a subcontractor's or, where appropriate, a contractor's: (1) Death or physical disability, if the listed subcontractor is an individual; (2) dissolution, if a

corporation or partnership; (3) bankruptcy; (4) inability to furnish any performance and payment bond shown on the bid form; (5) inability to obtain, or loss of, a license necessary for the performance of the particular category of work; (6) failure or inability to comply with a requirement of law applicable to contractors, subcontractors, or construction, alteration, or repair projects; (7) failure to perform its agreement to execute a subcontract under C.G.S. § 4b-96, as revised.

1.6 The **bid price** shall be the price set forth in the space provided on the **bid form**. No bid shall be rejected (1) because of error in setting forth the name of a subcontractor as long as the subcontractor or subcontractors designated are clearly identifiable, or (2) because the plans and specifications do not accompany the bid or are not submitted with the bid. Failure to correctly state a **subcontractor's price** shall be cause for rejection of the bid.

1.7 Each contractor who is awarded a contract on or after October 1, 2002 shall be subject to provisions of the C.G.S. § 31-53 as amended by Public Act 02-69, "An Act Concerning Annual Adjustments to Prevailing Wages."

1.8 In determining bid price, consideration should be given to C.G.S. § 31-53 and 31-55a of the Connecticut General Statutes regarding **annual adjustment of prevailing wage rates.** Annual adjustments of prevailing wage rates will not be considered a matter for a contract amendment.

1.9 Any contractor who violates any **provision** of said **C.G.S. § 4b-95** may be **disqualified** from bidding on other contracts that are subject to the provisions of **Chapter 60** of the Connecticut General Statutes, as revised, for a **period** not to exceed twenty-four months, commencing from the date on which the violation is discovered, for each violation. The awarding authority shall periodically review the contractor's subcontracts to insure compliance with such provisions, and shall after each such review prepare a written report setting forth his findings and conclusions.

1.10 **Bids** shall be submitted *only* on the **forms furnished** for the specific project. In *no* event will bids or changes in bids made by telephone, telegraph, facsimile or other communication technology be considered. *Any* bid form omitting or adding items, altering the form, containing conditional or alternative bids, or *without* the original signature of the bidder or its authorized representative, will be *rejected*.

1.11 Any bid received *after* the **scheduled closing time** for the receipt of bids will be returned to the bidder unopened.

1.12 Any **bid** once deposited with the **Department of Construction Services (CT DCS)** may only be **withdrawn** by **letter** of request, signed by the depositing bidder and presented to the **DAS** Supervisor, Bidding and Contracts Unit, *prior* to the time of opening of any bid for the project designated or identified project.

1.13 **Gift And Campaign Contribution Certification:** In accordance with Executive Order 7C, and pursuant to Public Act 11-229, any principal or key personnel of the person, firm or corporation submitting a bid or proposal for a contract that has a value of **$50,000** or more, shall be required to **electronically upload** a **Gift And Campaign Contribution Certification** prior to or at the time of the bid proposal submission. Instructions on how to electronically upload the **Gift And Campaign Contribution Certification** are available from the website of the Connecticut Department of Administrative Services (CT DAS), "Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online". **The Vendor Guide** can be *found* at http://www.ct.gov click on Doing Business > Doing Business with the State > State Procurement > **Business Friendly Initiatives** > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online (PDF).

Pursuant to C.G.S. § 4-252(d), and Public Act 11-229, any bidder or proposer that does not **electronically upload** the certification as required under this section shall be disqualified and CT DCS shall award the contract to the next highest ranked proposer or the next lowest responsible qualified bidder or seek new bids or proposals.

Once uploaded, an updated **Gift and Campaign Contribution Certification** shall be **electronically uploaded** within **30 days** of any changes to the submitted information.

Annually, on *or* within two (2) weeks of the **anniversary** date of the execution of this contract, the Contractor shall **electronically upload** a completed **Annual Certification** with authorizing resolution. For the purposes of this paragraph, the execution date of the contract will be the date the Commissioner of CT DCS signs the contract.

1.14 **Affirmation of Receipt of State Ethics Laws Summary:** Pursuant to Section 37 of **Public Act 05-287,** when the CT DCS is seeking a contract for a large state construction or procurement contract having a cost of more than **$500,000**, CT DCS shall inform all potential consultant and contractor firms to **electronically download** the ***"Guide to the Code of Ethics For Current or Potential State Contractors"*** from the website of Office of State Ethics (OSE).

Pursuant to Public Act 11-229, CT DCS is also required to notify all potential consultant and contractor firms for a large state construction or procurement contract that they must **electronically upload** prior to or at the time of the bid proposal submission an *"**Affirmation of Receipt of State Ethics Laws Summary"*** affirming that their key employees have read and understand the summary and agree to comply with the provisions of state ethics law. Instructions on how to electronically upload an *"**Affirmation of Receipt of State Ethics Laws Summary"*** are available from the website of the Connecticut Department of Administrative Services (CT DAS), "Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online". **The Vendor Guide** can be *found* at http://www.ct.gov click on Doing Business > Doing Business with the State > State Procurement > **Business Friendly Initiatives** > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online (PDF).

Failure to provide this affidavit with the bid proposal shall result in **rejection** of the bid. The **summary** includes a **note** regarding the more stringent CT DCS policy regarding gifts. *If* you decide to use the **Ethics Summary** posted on the **OSE web site** you must also add to it the **Note** which is set forth below.

Note re: DCS Policy:
The policy of the Department of Construction Services (DCS) in regard to gifts or anything of value is more stringent than the State Ethic Code. Under the CT DCS policy, no employee of CT DCS can directly or indirectly solicit or accept anything or value; other than a cup of coffee or tea, or a bottle of soda or water; from any developer, contractor, consultant, vendor, realtor, or lessor, or any person or organization on their behalf, with who CT DCS has or may have a business relationship. Accordingly, any person, or contractor, consultant, or any other business doing business with or seek do business with CT DCS may not directly or indirectly give anything of value other than a cup of coffee or tea, or a can or bottle of soda or water, to an employee.

Furthermore, the successful bidder shall provide the **Summary of the State Ethics Laws**, to each **named subcontractor** and any other **subcontractor** or **subconsultant** with a contract valued over $500,000 and obtain a **Subcontractor and Subconsultant State Ethics Affidavit** that the key personnel of the subcontractor have read, understand, and agree to comply with provisions of the state ethics laws. The successful bidder shall provide such subcontractor(s) affidavit to the Department of Construction Services.

1.15 **Consulting Agreement Affidavit and Certificate (of Authority):** A **Consulting Agreement Affidavit** must be completed and electronically uploaded prior to or at the time of the bid proposal submission for contracts with a value of $50,000 or more. A **Certificate (of Authority)** shall be submitted with the bid proposal to CT DAS Procurement Services for contracts with a value of $50,000 or more.

Instructions on how to electronically submit the **Consulting Agreement Affidavit** are available from the website of the Connecticut Department of Administrative Services (CT DAS), "Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online": **The Vendor Guide** can be *found* at http://www.ct.gov click on Doing Business > Doing Business with the State > State Procurement > **Business Friendly Initiatives** > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online (PDF).

Once uploaded, an updated **Consulting Agreement Affidavit** shall be **electronically uploaded** within **30 days** of any changes to the submitted information. Once uploaded, the Affidavit shall be updated and submitted as required by the Office of Policy and Management and the Connecticut Department of Administrative Services. For the purposes of this paragraph, the **execution date** of the contract will be the date the Commissioner of CT DCS signs the contract.

In the event that a bidder or vendor *refuses* to submit the *affidavit* required under Conn. Gen. Stat. § 4a-81, such bidder shall be *disqualified* and the award shall be made to the next lowest responsible qualified bidder or new bids or proposals shall be sought.

The **Certificate (of Authority)** can be found in **Section 00 40 14 Certificate (of Authority).**

1.16 **State Election Enforcement Commission:** With regard to a State contract as defined in **P.A. 07-01** having a value in a calendar year of $50,000 or more or a combination or series of such **agreements** or **contracts** having a value of $100,000 or more, the **authorized signatory** to this **submission** in response to the State's solicitation expressly **acknowledges receipt** of, and must submit to DAS Procurement Services with the bid proposal submission, the **State Election Enforcement Commission's Form 10 notice** advising prospective state contractors of the state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the **notice**. See the SEEC website www.ct.gov/seec for downloading **SEEC Form 10.**

1.17 **Nondiscrimination Certification:** A nondiscrimination certification is required for all State contracts, regardless of type, term, cost or value. The **appropriate form** must be **electronically uploaded** prior to or at the time of

the bid proposal submission. Instructions on how to electronically upload the **Nondiscrimination Certification** are available from the website of the Connecticut Department of Administrative Services (CT DAS), "Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online": **The Vendor Guide** can be *found* at http://www.ct.gov click on Doing Business > Doing Business with the State > State Procurement > **Business Friendly Initiatives** > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online (PDF).

For the **list of Nondiscrimination forms and descriptions** go to the **Office of Policy and Management (OPM) website,** www.ct.gov/opm, *under* **Featured Links** > Nondiscrimination Certification

1.18 When a **mandatory bid conference** is required, bids submitted by contractors who have **not properly registered** and attended the mandatory pre-bid conference shall be rejected as **non-responsive**. All attendees of the pre-bid conference will be required to register. **Proper registration** means that the attendee has signed his or her name to the official roster and listed the name and address of the company he or she represents on the official roster no later than the designated start time of the pre-bid conference. Bidders are advised to register early as **no** attendee will be allowed to register *after* the advertised start time of the pre-bid conference.

1.19 In the event that a bidder or vendor refuses to submit the **consulting affidavit** required under subsection (b) of section 51 of Public Act 05-287, such bidder shall be *disqualified* and the award shall be made to the next lowest responsible qualified bidder or new bids or proposals shall be sought.

1.20 All acquisitions, agreements and contracts are subject to the provisions of the C.G.S. § 9-333n (transferred to 9-612) regarding **CAMPAIGN CONTRIBUTION RESTRICTION**.

1.21 Each contract between a state or quasi-public agency and a large state contractor shall provide that, if an officer, employee, or appointing authority of a large state contractor takes or threatens to take any personnel action against any employee of the contractor in **retaliation** for such employee's **disclosure** of information to the Auditors of Public Accounts or the Attorney General under the provisions of subsection (a) of Section 4-61dd of the Connecticut General Statutes, the contractor shall be liable for a civil penalty of not more than five thousand dollars for each offense, up to a maximum of twenty per cent of the value of the contract. Each violation shall be a separate and distinct offense and in the case of a continuing violation each calendar day's continuance of the violation shall be deemed to be a separate and distinct offense. The executive head of the state or quasi-public agency may request the Attorney General to bring a civil action in the Superior Court for the judicial district of Hartford to seek imposition and recovery of such civil penalty.

Each large state contractor shall post a **notice** of the provisions of Section 4-61dd relating to large state contractors in a conspicuous place that is readily available for viewing by the employees of the contractor.

1.22 It is agreed that this contract shall be governed by, construed, and enforced in accordance with the **laws of the State of Connecticut**.

1.23 Nothing in this Agreement shall be construed as a waiver or limitation upon the **State's sovereign immunity**. To the extent this Section is found to be inconsistent with any other part of this Agreement, this Section shall control. This Section of the Agreement shall survive the completion and/or termination of this Agreement.

1.24 Pursuant to Connecticut General Statutes Sec. 31-53b (a) each contract entered into on

or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by any political subdivision of the state or any of its agents, where the total cost of all work to be performed by all contractors and subcontractors in connection with the contract is at least one hundred thousand dollars, shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building, pursuant to such contract, have completed a **course** of at least ten hours in duration in **construction safety and health** approved by the federal Occupational Safety and Health Administration or, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268.

1.25 Bidders are responsible for **addenda** as noted in Article 4 of this notice. **Failure to acknowledge** all **addenda** in the space provided in Bid Proposal Form shall be cause for **rejection** of the bid.

1.26 The Department of Construction Services *may* reject a bid as **non-responsive** *if* the bidder does *not* make all required **pre-award submittals** *within* the time designated by the Department of Construction Services.

ARTICLE 2 BID SECURITY:

Each bid must be accompanied by a **certified check** made payable to "Treasurer, State of Connecticut," or the bid must be accompanied by a **bid bond**, in the form required by the awarding authority, having as **surety** thereto such surety

company or companies acceptable to the Commissioner of the Department of Construction Services and as are authorized to do business in this State, for an amount not less than 10 percent of the bid. All **checks** submitted by **unsuccessful** bidders shall be returned to them *after* the contract has been awarded.

ARTICLE 3 Forfeit Of Bid Security:

Failure of the successful bidder to execute a contract awarded as specified and bid shall result in the **forfeiture** of the bid bond or certified check.

ARTICLE 4 Addenda And Interpretations:

No interpretations of the meaning of the plans, specifications or other contract documents will be made orally to any bidder. Every **request** for such interpretation should be in writing to the awarding authority and to be given consideration *must* be received at least **ten (10)** days *prior* to the date fixed for the opening of bids. Any and all such **interpretations** and any **supplemental instructions** will be in the form of written **addenda** to the specifications which, *if* issued, will be posted on the **CT DCS Website and State Contracting Portal**. However, at the discretion of the awarding authority the addenda *may* be *mailed* no later than **seven** (7) days *prior* to the date fixed for the opening of bids to those prospective bidders (at the respective addresses furnished for such purposes) who do not have email accounts and request the fiscal officer to mail them the addenda; failure of any bidder to receive any such **addendum** or **interpretation** shall not release any bidder from any obligations under its bid as submitted. It shall be the **bidder's responsibility** to make inquiry as to, and to obtain, the addenda issued, if any.

ARTICLE 5 Executive Orders:

The Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Contractor's request, the Client Agency shall provide a copy of these orders to the Contractor. The Contract may also be subject to Executive Order No. **7C** of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

ARTICLE 6 (Intentionally left Blank)

ARTICLE 7 (Intentionally left Blank)

ARTICLE 8 Sexual Harassment Policy

This contract is subject to the provisions of the Department of Construction Services Sexual Harassment Policy ("Policy") and, as such, the contract may be canceled, terminated, or suspended by the CT DCS for violation of or noncompliance with said Policy. Said document is hereby incorporated herein by reference and made a part hereof as though fully set forth herein. This policy may be found at the **Department of Construction Services Website** at **http://www.ct.gov/dcs**, under **Publications**.

ARTICLE 9 Certificate of Legal Existence:

A **corporation** that is awarded the contract must comply with the laws of this State regarding the procurement of a certificate of authority to transact business in this State from the **Secretary of the State**. A Certificate of Legal Existence which is not older than ninety (90) days from the date of the contract signing must be filed with the Department of Construction Services' Purchasing Officer.

ARTICLE 10 Security For Faithful Performance:

10.1 Performance Bond:
On or before the contract award date, the successful bidder shall substitute for the **certified check** or **bid bond** accompanying its bid an executed **performance bond**, in the amount not less than 100 percent of the contract price, conditioned upon the faithful performance of the contract, and having as surety thereto such surety company or companies satisfactory to the Commissioner and as are authorized to transact business in this State. This bond is to be furnished pursuant to **C.G.S. § 49-41**, as revised.

10.2 Labor and Material Bond:

At this same time, the successful bidder shall submit a labor and material bond in the amount not less than 100 percent of the contract price which shall be binding upon the award of the contract to such bidder, with surety or sureties satisfactory to the Commissioner and as are authorized to transact business in this State, for the protection of persons supplying labor or materials in the prosecution of the work provided for in the contract for the use of each such person. Any such bond furnished shall have as principal the name of the successful bidder. This bond is to be furnished pursuant to **C.G.S. § 49-41**, as revised.

The following sections of the General Statutes of Connecticut, as revised, are inserted as information concerning this bond:

C.G.S. § 49-41a. Enforcement of payment by general contractor to subcontractor and by subcontractor to his subcontractors.

(a) When any public work is awarded by a contract for which a payment bond is required by section 49-41, the contract for the public work shall contain the following provisions: (1) A requirement that the general contractor, within thirty days after payment to the contractor by the State or a municipality, pay any amounts due any subcontractor, whether for labor performed or materials furnished, when the labor or materials have been included in a requisition submitted by the contractor and paid by the State or a municipality; (2) a requirement that the general contractor shall include in each of its **subcontracts** a **provision** requiring each **subcontractor** to pay any amounts due any of its subcontractors, whether for labor performed or materials furnished, *within* thirty days *after* such subcontractor receives a payment from the general contractor which encompasses labor or materials furnished by such subcontractor.

(b) If payment is not made by the general contractor or any of its subcontractors in accordance with such requirements, the subcontractor shall set forth his claim against the general contractor and the subcontractor of a subcontractor shall set forth its claim against the subcontractor through notice by registered or certified mail. Ten days after the receipt of that notice, the general contractor shall be liable to its subcontractor, and the subcontractor shall be liable to its subcontractor, for interest on the amount due and owing at the rate of one percent per month. In addition, the general contractor, upon written demand of its subcontractor, or the subcontractor, upon written demand of its subcontractor, shall be required to place funds in the amount of the claim, plus interest of one per cent, in an interest-bearing escrow account in a bank in this State, provided the general contractor or subcontractor may refuse to place the funds in escrow on the grounds that the subcontractor has not substantially performed the work according to the terms of his or its employment. In the event that such general contractor or subcontractor refuses to place such funds in escrow, and the party making a claim against it under this section is found to have substantially performed its work in accordance with the terms of its employment in any arbitration or litigation to determine the validity of such claim, then such general contractor or subcontractor shall pay the attorney's fees of such party.

(c) No payment may be withheld from a subcontractor for work performed because of a dispute between the general contractor and another contractor or subcontractor.

(d) This section shall not be construed to prohibit progress payments prior to final payment of the contract and is applicable to all subcontractors for material or labor whether they have contracted directly with the general contractor or with some other subcontractor on the work.

C.G.S. § 49-42. Enforcement of right to payment on bond. Suit on bond, procedure and judgment.

(a) Any person who performed work or supplied materials for which a requisition was submitted to, or for which an estimate was prepared by, the awarding authority and who does not receive full payment for such work or materials within sixty days of the applicable payment date provided for in subsection (a) of section 49-41a, or any person who supplied materials or performed subcontracting work not included on a requisition or estimate who has not received full payment for such materials or work within sixty days after the date such materials were supplied or such work was performed, may enforce such right to payment under the bond by serving a notice of claim on the surety that issued the bond and a copy of such notice to the contractor named as principal in the bond within one hundred eighty days of the applicable payment date provided for in subsection (a) of section 49-41a, or, in the case of a person supplying materials or performing subcontracting work not included on a requisition or estimate, within one hundred eighty days after the date such materials were supplied or such work was performed. The notice of claim shall state with substantial accuracy the amount claimed and the name of the party for whom the work was performed or to whom the materials were supplied, and shall provide a detailed description of the bonded project for which the work or materials were provided. If the content of a notice prepared in accordance with subsection (b) of section 49-41a complies with the requirements of this section, a copy of such notice, served within one hundred eighty days of the payment date provided for in subsection (a) of section 49-41a upon the surety that issued the bond and upon the contractor named as principal in the bond, shall satisfy the notice requirements of this section. Within ninety days after service of the notice of claim, the surety

shall make payment under the bond and satisfy the claim, or any portion of the claim which is not subject to a good faith dispute, and shall serve a notice on the claimant denying liability for any unpaid portion of the claim. The notices required under this section shall be served by registered or certified mail, postage prepaid in envelopes addressed to any office at which the surety, principal or claimant conducts his business, or in any manner in which civil process may be served. If the surety denies liability on the claim, or any portion thereof, the claimant may bring action upon the payment bond in the superior court for such sums and prosecute the action to final execution and judgment. An action to recover on a payment bond under this section shall be privileged with respect to assignment for trial. The court shall not consolidate for trial any action brought under this section with any other action brought on the same bond unless the court finds that a substantial portion of the evidence to be adduced, other than the fact that the claims sought to be consolidated arise under the same general contract, is common to such actions and that consolidation will not result in excessive delays to any claimant whose action was instituted at a time significantly prior to the motion to consolidate. In any such proceeding, the court judgment shall award the prevailing party the costs for bringing such proceeding and allow interest at the rate of interest specified in the labor or materials contract under which the claim arises or, if no such interest rate is specified, at the rate of interest as provided in section 37-3a upon the amount recovered, computed from the date of service of the notice of claim, provided, for any portion of the claim which the court finds was due and payable after the date of service of the notice of claim, such interest shall be computed from the date such portion became due and payable. The court judgment may award reasonable attorneys fees to either party if upon reviewing the entire record, it appears that either the original claim, the surety's denial of liability, or the defense interposed to the claim is without substantial basis in fact or law. Any person having direct contractual relationship with a subcontractor but no contractual relationship express or implied with the contractor furnishing the payment bond shall have a right of action upon the payment bond upon giving written notice of claim as provided in this section.

(b) Every suit instituted under this section shall be brought in the name of the person suing, in the superior court for the judicial district where the contract was to be performed, irrespective of the amount in controversy in the suit, but no such suit may be commenced after the expiration of one year after the applicable payment date provided for in subsection (a) of section 49-41a, or, in the case of a person supplying materials or performing subcontracting work not included on a requisition or estimate, no such suit may be commenced after the expiration of one year after the date such materials were supplied or such work was performed.

(c) The word "material" as used in section 49-41 to 49-43, inclusive, includes the rental of equipment used in the prosecution of work provided for in the contract.

ARTICLE 11 CONNECTICUT SALES AND USE TAXES:

All bidders shall familiarize themselves with the current statutes and regulations of the **Department of Revenue Services**. The tax on materials or supplies exempted by such statutes and regulations shall not be included as part of a bid.

Nonresident contractors must comply with the **provisions C.S.G. § 12-430(7)**, **Bond requirement for nonresident contractors**, and the regulations established pursuant to that section.

ARTICLE 12 Contractor's Qualifications:

All bidders shall file with their bids a **statement of qualifications** on the appropriate form.

ARTICLE 13. Subcontractors:

As required by the **Bid Proposal Form**, each bidder shall furnish with its submitted bid, and in the place on the bid form provided for such purpose, the **names of responsible and qualified subcontractors** who are actually to perform the work required by the division or portion of the specifications listed for the base bid. **Failure to so list a subcontractor** for any division or portion of the specifications will result in the **rejection** of the entire bid.

ARTICLE 14 NOT USED

ARTICLE 15 Nondiscrimination and Affirmative Action Provisions:

This section is inserted in connection with Subsection (a) of C.G.S. § 4a-60 of the General Statutes of Connecticut, as revised.

References in this section to "contract" shall mean this Contract and references to "contractor" shall mean the Contractor.

a. (1) The contractor agrees and warrants that in the performance of the contract such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut. The contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved; (2) the contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the commission; (3) the contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the commission advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the contractor agrees to comply with each provision of this section and sections 46a-68e and 46a-68f and with each regulation or relevant order issued by said commission pursuant to sections 46a-56, 46a-68e and 46a-68f; (5) the contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor as relate to the provisions of this section and section 46a-56.

b. If the contract is a CT DCS contract, the contractor agrees and warrants that he will make **good faith efforts** to employ **minority business enterprises** as subcontractors and suppliers of materials on such CT DCS project.

c. "Minority business enterprise" means any small contractor or supplier of materials fifty-one per cent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) Who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise and (3) who are members of a minority, as such term is defined in subsection (a) of section 32-9n; and "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. "Good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.

d. **Determination** of the contractor's good faith efforts shall include but shall not be limited to the following factors: The contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the commission may prescribe that are designed to ensure the participation of minority business enterprises in CT DCS projects.

e. The contractor shall develop and maintain adequate documentation, in a manner prescribed by the commission, of its good faith efforts.

f. The contractor shall include the **provisions** of sections (a) and (b) above in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the commission. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with section 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission, the contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

ARTICLE 16 Nondiscrimination Provisions Regarding Sexual Orientation:

This section is inserted in connection with Subsection (a) of Section 4a-60a of the General Statutes of Connecticut, as revised.

a. (1) The contractor agrees and warrants that in the performance of the contract such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the state of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said commission pursuant to section 46a-56; and (4) the contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor which relate to the provisions of this section and section 46a-56.

b. The contractor shall include the provisions of section (a) above in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the commission. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with section 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission, the contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

c. For the purposes of this entire Non-Discrimination section, "contract" includes any extension or modification of the contract, "contractor" includes any successors or assigns of the contractor, "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced, and "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders. For the purposes of this section, "contract" does not include a contract where each contractor is (1) a political subdivision of the state, including, but not limited to, a municipality, (2) a quasi-public agency, as defined in Conn. Gen. Stat. Section 1-120, (3) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in Conn. Gen. Stat. Section 1-267, (4) the federal government, (5) a foreign government, or (6) an agency of a subdivision, agency, state or government described in the immediately preceding enumerated items (1), (2), (3), (4) or (5).

A **nondiscrimination certification** is required for all State contracts, regardless of type, term, cost or value. The **appropriate form** must be **electronically uploaded** *prior to or at the time of the bid proposal submission*. Instructions on how to electronically upload the **Nondiscrimination Certification** are available from the website of the Connecticut Department of Administrative Services (CT DAS), "Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online": **The Vendor Guide** can be *found* at http://www.ct.gov click on Doing Business > Doing Business with the State > State Procurement > **Business Friendly Initiatives** > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online (PDF).

For the **list of Nondiscrimination forms and descriptions** go to the **Office of Policy and Management (OPM) website,** www.ct.gov/opm, *under* **Featured Links** > Nondiscrimination Certification.

ARTICLE 17 Union Labor:

Attention is called to the fact that there may be construction work now being carried on at the site at which construction is contemplated being done by union labor. This fact must be kept in mind by all bidders.

ARTICLE 18 Labor Market Area:

All bidders shall have read **Sections 31-52** and **31-52a** of the **Connecticut General Statutes**, as revised. These sections relate to the **preference of State citizens** and the **preference of residents of the labor market area** in which the work under the contract is to be done and the **penalties for violations** thereof.

In order to avoid violations by the contractor and to cooperate with and assist the State in the implementation of the statutory mandates, any bidder awarded a contract with the State shall be required to provide the State with the following information:

18.1 The names and addresses of employees utilized by the contractor and by its subcontractors and how long each such employee has resided in Connecticut.

18.2 How long each employee has resided in the labor market area, as established by the State Labor Commissioner, in which the work under the contract is to be done. Labor market areas are indicated on the end of this section.

18.3 Within thirty (30) days after the start of work, the contractor shall submit a signed statement setting forth the procedures the contractor and its subcontractors have taken to assure that they have sought out qualified residents of the labor market area. Also, the statement shall include information as to how many persons were considered for employment and how many were actually hired. Such procedures will include, but not be limited to, obtaining names of available persons from area Employment Security Offices.

18.4 In the same manner as item (18.3) above, the statement shall indicate the steps taken to assure that the contractor and its subcontractors have sought out qualified residents of this State.

18.5 The contractor shall cooperate with and provide information to the construction supervisor or inspector of the State assigned to collect and verify the information required. The State may request that all such information be updated during the term of the contract at reasonable times.

18.6 All such information gathered and compiled by the State shall be forwarded to the Labor Commissioner.

18.7 ***Pursuant to* C.G.S. § *31-52b, as revised:***

"The provisions of C.G.S. § 31-52 and 31-52a shall not apply where the State or any subdivision thereof may suffer the loss of revenue granted or to be granted from any agency or department of the federal government as a result of said sections or regulative procedures pursuant thereto."

However, no exception shall be determined to be applicable unless stated in writing by the Commissioner of the Department of Construction Services

18.8 Website Link:

For guidance on the CT Department of Labor (DOL) Labor Market Areas (LMA) visit CT-DOL Website Link: **http://www1.ctdol.state.ct.us/lmi/misc/lmatowns.asp**.

END OF SECTION

WORKING PROCEDURES DURING CONSTRUCTION

SECTION I – GENERAL

A. Contact between the budgeted agency and the Architect/Engineer will be through the Construction Administrator assigned to the project. Contact between the Architect and the Contractor will be through the Construction Administrator, except on matters relating to shop drawings (Section 5 below); approval of materials (Section 6); approval of samples (Section 7).

B. The control, field supervision, and inspection of this project through the date of guarantee required by the General Conditions will be conducted by the University or its designated representative ,as directed by the University Architect delegated by the Commissioner to the Director of Construction Services ,whose project organization includes the following:

(1) Director of Facilities Planning & Engineering/University Representative
(2) Associate Director/Assistant Director of Facilities Planning & Engineering
(3) Construction Administrator/University Representative/ Project Manager
(4) Architect/ Engineer

C. The Construction Administrator assigned to the project is responsible to his superiors for the control, field supervision, and inspection of the project. The Contractor and the Architect/Engineer submit to the Construction Administrator a separate written statement on each question of contract interpretation, contract discrepancy, contract change, or on any question concerning a deviation from the contract requirements.

SECTION 2 – CORRESPONDENCE

A. Standard practice is to be as follows:

1. All correspondence must bear the correct title and assigned contract number for purposes of identification.

2. For ease in filing, a separate letter must be issued for each subject. SEVERAL SUBJECTS ARE NOT TO BE COMBINED IN ONE LETTER.

3. All shop drawings, samples, etc., must be accompanied by a transmittal letter, which should be clear as to what is being transmitted.

4. Persons and/or firms receiving copies shall be noted on all copies of each letter. A check mark is to be placed beside each name so as to designate to whom the copy belongs.

5. The following procedures as to be followed:
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a. A copy of every letter addressed by the Architect/Engineer to the Construction Administrator (and vice versa) is to be sent to the Director of Facilities Planning & Engineering.

b. A copy of every letter addressed by the Architect/Engineer to the Contractor (and vice versa) is to be sent to the Director of Facilities Planning and Engineering and Construction Administrator.

c. A copy of every letter addressed by the Contractor to the Construction Administrator (and vice versa) is to be sent to the Director of Facilities Planning and Engineering and the Architect/Engineer.

d. A copy of every letter addressed by either the Construction Administrator or the Architect/Engineer to the budgeted agency is to be sent to the Director of Facilities Planning and Engineering.

B. All correspondence addressed to the Director of Facilities Planning & Engineering is to be sent to Western Connecticut State University, 181 White Street, Danbury, CT 06810. Letters shall be sent direct and with the least possible delay.

SECTION 3 – JOB DRAWINGS, DETAIL DRAWINGS, ETC.

A. The Architect/Engineer will furnish four (4) prints, three (3) to be sent by transmittal letter directly to the Construction Administrator on the job and one (1) directly to the Director of Facilities Planning and Engineering with one (1) copy of the transmittal letter. A copy of the transmittal letter only is to be sent directly to the Director of Facilities Planning & Engineering, and three (3) prints are to be sent directly to the Contractor together with a copy of the same transmittal letter.

SECTION 4 – APPROVAL OF SUBCONTRACTORS

A. Initial submission shall be as prescribed in the proposal attached to and made a part of the contract. Subsequent submission(s), on the Contractor's letterhead, shall include the name of the proposed subcontractor(s), what services they will be providing, and the contract amount. This information is sent to the Director of Facilities Planning and Engineering, with a copy to the Architect/Engineer, and the Construction Administrator. The Contractor will be notified by the University on approvals of all subcontractors.

SECTION 5 – SHOP DRAWINGS

A. The Contractor shall forward, after detailed checking in his office, with a transmittal letter, three (3) prints of each shop drawing to the Architect/Engineer for initial checking, following the procedure as outlined in paragraph 2 above. At the same time, the Contractor shall send a copy of the transmittal letter to the Director of Facilities Planning and Engineering, and one (1) copy to the Construction Administrator, assigned to the project.

B. After corrections have been made, or when the shop drawings are finally approved, the Contractor is to furnish a total of seven (7) prints of each drawing to the Architect/Engineer. For sprinkler shop drawings, provide a total of ten (10) prints. All prints to include the project name and DCS project number.

C. Noting his action on shop drawings, the Architect/Engineer shall:

1. Retain two (2) sets of drawings for his files.

2. Return two (2) sets to the Contractor with a transmittal letter.

3. Send one (1) set to the District Construction Supervisor together with a copy of the transmittal letter.

4. Send two (2) sets to the Construction Administrator, with one (1) copy of the transmittal letter.

5. In the case of fire sprinkler systems only, add (3) sets of final approved shop drawings to make a total of (10) sets. Two (2) sets will be sent to the States Insurance Carrier. One (1) set (if the building exceeds the threshold limit) shall be sent to the State Fire Marshals office for ultimate approval and compliance. The sets submitted to the Fire Marshal and Insurance Carrier shall include hydraulic calculations, and manufacturers' specification sheets for all sprinkler heads, backflow preventors, and fire pumps (including pump curves).

SECTION 6 – APPROVAL OF MATERIALS

A. The Contractor shall submit directly to the Architect/Engineer for approval a list of all materials and equipment proposed for use on the project, following the procedure outlined in paragraph 2 above. Approval or disapproval will be handled as follows. Note that there are three (3) broad classifications to be considered:

1. Action on any material or equipment which is named by brand in the specifications will be taken by the Architect/Engineer.

2. When the Contractor proposes an equal for any specified material or equipment, he shall submit to the Architect/Engineer full information (manufacturer's brochure, etc.) covering the item proposed. The Architect/Engineer will evaluate the data and submit three (3) copies of the information along with his recommendations to the Director of Facilities Planning and Engineering, who will inform the Contractor of the decision.

3. If the Contractor proposes material or equipment that deviates from the specifications (a substitution to be handled by a change order), he shall submit full information about the item, and a credit to the owner, where applicable, supported by the manufacturer's original quotation for specified material and that for the substitution. The Architect/Engineer will review this data, and submit three (3) copies of the information along with his recommendations to the Director of Facilities Planning and Engineering, who will notify the Contractor of the decision.

4. Time limitations for making submittals on equals or for substitutions, shall be in accordance with Article 14 of the General Conditions.

B. Selection of paint colors and colors of interior finished materials shall be made by the Architect/Engineer, who will be responsible for obtaining approval of the using agency. After receiving this approval, he will notify the Contractor.

SECTION 7 – APPROVAL OF SAMPLES

A. Procedure on approval of samples will be the same as for materials; however, in most cases, samples delivered by the Contractor to the job site will be examined there and will be held there until completion of the work. Approval by the Architect/Engineer is to be in writing following procedure outlined in Section 6A. (2).

SECTION 8 – REPORTS ON WORK AT SITE

A. The diary kept by the Construction Administrator on the job will be available for the Architect/Engineer. The CC/S will also keep a list of questions for determination by the Architect/Engineer.

B. Observation reports by the Architect/Engineer are also required.

SECTION 9 – INSURANCE CERTIFICATES

A. All certificates, in triplicate, will be sent to the Contracts Supervisor of the Contract Section.

SECTION 10 – INSTRUCTIONS ON THE WORK

A. All instructions on the job will be given the Contractor by the Construction Administrator, who will make any decisions not in conflict with the plans and specifications. He will advise the Architect/Engineer at all times as to actions taken. On matters of major importance, the Construction Administrator will consult with the Director of Facilities Planning and Engineering and the Architect/Engineer and obtain clearance before giving instructions to the Contractor.

B. On engineering projects, each Architect/Engineer will keep the Engineering Section of the Department of Construction Services advised concerning instructions and interpretations given by him, and in no case will authorize engineering changes in the plans or specifications without receiving prior approval of the Engineering Section.

C. Deviations from plans and specifications will be handled by a change order.

SECTION 11 – SCHEDULE OF VALUES OF THE WORK

A. The Contractor shall prepare, on forms furnished by the Department of Construction Services, one (1) pencil copy of the schedule of values, for various parts of the work, broken down as directed, aggregating the total sum of the contract, and submit to the assigned Construction Administrator for review.

B. Following this review and initialing by the Mechanical/Electrical Specialist, if applicable, the Construction Administrator will transmit the initialed copy of the schedule of values to the Hartford office for further processing.

C. After final approval, the Hartford office will notify the Contractor to submit the final typed schedule of values in the number of copies required.

D. Under no circumstances is the Contractor to submit a requisition for partial payment until the schedule of values has been approved.

SECTION 12 – REQUISITIONS

A. The Contractor's requests for partial payment shall be itemized to correspond with the approved schedule of values. Requisitions shall be submitted directly to the Construction Administrator for approval and processing.

B. Requisitions for requests for partial payment shall be submitted once a month directly to the Construction Administrator assigned to the project.

SECTION 13 – CHANGE ORDERS

A. Any change for improvement of the work or to provide for field conditions suggested by the budgeted agency, the Department of Construction Services, the Contractor, or the Architect/Engineer, will be handled by the Construction Administrator assigned to the project. The Construction Administrator is to determine the necessity for the change and clear with the Architect/Engineer and the budgeted agency. He may ask the Architect/Engineer to prepare any documents necessary to process the change, and he will obtain from the Contractor any estimate covering additions to or deductions from the contract price.

B. Changes requested by the agency must first be addressed by the agency head to the Commissioner of Construction Services for consideration and approval before any action will be taken by the Construction Administrator.

C. To expedite change orders during the course of construction, proposals are to be submitted directly to the assigned Construction Administrator (in the number of copies requested) with a copy to the Director of Facilities Planning and Engineering, the District Construction Supervisor, and the Architect/Engineer.

D. After review and comment by the budgeted agency, the request for change order, with all back-up, including the architect's/engineer's recommendations and a definite statement of need and/or reason for the change, will be submitted by the Construction Administrator to the central office of the Department of Construction Services. On approval by the Commissioner, a change order to the contract will be issued authorizing the change.

E. The amount of compensation to be paid for additional work shall be in accordance with Article 13 of the General Conditions.

F. Lump sum proposals are to contain certain quantities and unit prices and be itemized in sufficient detail to give the Department of Construction Services a basis for checking. When a subcontractor's price is included in the general contractor's proposal, the subcontractor's breakdowns to be included. Credits must be deducted before the percentage can be applied.

G. Every proposal is to state whether or not extension of time is required, and if so, of how many days.

H. In the event of disagreement between the Contractor and the Cost Review Section as to the amount of the proposal, the Cost Review Section will take the matter up with the Contractor through the Construction Administrator on the job or, if more expedient, directly with the Contractor.

I. In no case is a Contractor to proceed without an approved Change Order, or if necessary, to expedite the work, a proceed order authorized by the Commissioner of the Director of Construction, as provided in Articles 13 and 26 of the General Conditions. This shall not, however, affect the power of the Contractor to act in a case of emergency, threats of injury to persons, damage to the work or an adjacent property.

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State Building Projects Inspection Procedures

The Office of the State Building Inspector (OSBI) and the Office of the State Fire Marshal (OSFM) are charged with the responsibility to ensure that State building projects are constructed in compliance with the State Building and Fire Safety Codes. Compliance with these Codes also includes compliance to the approved plans and specifications for the project as well as manufacturers' installation instructions requirements.

There are multiple inspections performed on construction sites: structural, architectural, electrical, mechanical, plumbing, accessibility, energy conservation, etc. The drawings and specifications, including numerous details contained within these documents, are substantial and complex. Our inspectors thoroughly inspect all work to verify that it has been done in compliance with approved documents and meets all code requirements prior to being concealed.

While our inspectors have a critical role to play in the construction process, we view our work as work that can be conducted most effectively when it is done in partnership with the project team. To that goal the following process is established.

At the beginning of each project our assigned inspector(s) will review and discuss the inspection procedure with the entire project team at a kickoff meeting in order to eliminate any confusion about the inspection process to be followed throughout construction of the project.

For each project we will ask for a primary contact from the Construction Administrator (CA). The CA will be responsible for verifying that trade work is complete and pre-tested by the contractor prior to requesting an inspection from OSBI or OSFM. The CA will also have any pertinent information (shop drawings, manufacturer's data, engineering judgements, SKS, etc.) assembled and readily available for the inspector at the time of his inspection. The CA will also accompany the inspector during the entire duration of his inspection. Failure to be complete and prepared will result in the inspection being aborted and necessitate rescheduling to a time when the work is complete and all preparations have been made. Continued failure to be prepared for requested inspections will result in a negative score on the CA's performance evaluation.

165 Capitol Avenue, Room 265
Hartford, CT 06106
Phone: (860) 713-5900 Fax: (860) 713-7410 www.ct.gov/dcs

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All inspection requests will be made using the following procedure:

The request must be emailed to our office at: OSBI.Inspections@ct.gov with copies to the assigned inspector(s) for the project.

The email shall include the following information:

- **The project name and project number.**
- **The date and time of the requested inspections.**
- **The type(s) of inspections requested.**
- **The name and phone number of the project contact person in case you need to be reached due to conflicts.**

Inspection requests shall be made at least 48 hours prior to the requested time of inspection

Multiple inspections can be scheduled in a single email. Just be clear as to the date and time of each inspection.

. The assigned OSBI/OSFM inspector will visit the site on the requested date and time, perform the scheduled inspection and either approve or reject the work inspected. The inspector will provide a written report of the inspection to the CA at the time of inspection.

In the event that there is a question, a clarification needed or a disputed interpretation, or any other concern regarding the inspection process, you may contact the State Building Inspector at (860) 713-5900 or the State Fire Marshal (860) 713-5750.

165 Capitol Avenue, Room 265
Hartford, CT 06106
Phone: (860) 713-5900 Fax: (860) 713-7410 www.ct.gov/dcs

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OSBI Required Inspections

Per Section 109.3 of the State Building Code, the following building code inspections are required on State construction projects under the jurisdiction of the Office of the State Building Inspector:

- **Footing and foundation inspections.** Footing and foundation inspections shall be made prior to placing concrete after required forms and reinforcement are in place and ready for inspection.
- **Concrete slab and under-floor inspection.** Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.
- **Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fire-blocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.
- **Fire-resistant penetrations.** Protection of joints and penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.
- **Energy efficiency inspections.** Inspections shall be made to determine compliance with the International Energy Conservation Code and shall include, but not be limited to, inspections for: envelope insulation R and U values, fenestration U value, duct system R value, and HVAC and water-heating equipment efficiency.
- **Electrical.** All electrical work shall be inspected prior to concealment. This includes underground conduit prior to burial; in-wall and above ceiling electrical prior to coverings; and under slab conduit prior to concrete. Notification shall be given for all testing of electrical systems including emergency/standby power systems, emergency lighting, fire pumps and fire alarm systems. Electrical panels and equipment shall be inspected prior to energizing. Inspections are required for temporary power to construction trailers or offices.
- **Plumbing/Mechanical.** All piping and mechanical systems shall be inspected prior to concealment. Notification shall be given for testing of all piping systems and smoke testing of ductwork for kitchen hood exhaust systems. All ductwork shall be inspected prior to being insulated. All fire dampers and smoke dampers shall be tested with the Office of State Building Inspector (OSBI) witnessing tests. All mechanical equipment shall be inspected prior to energizing. Equipment will be inspected for compliance to both code requirements and the manufacturer's installation requirements.
- **Other inspections.** In addition to the inspections specified above, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of the State Building Code.
- **Special inspections.** As required by the Statement of Special Inspections required through Section 1704.

cont./

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- **Final inspection.** The final inspection shall be made after all work required by the building permit is completed.

This list is offered as a guide to when an inspection should be scheduled. Basically, **an inspection is required prior to concealing work regulated by code or energizing equipment**. If there is a doubt, please call our office and we will clarify.

In addition, the Office of the State Building Inspector encourages the scheduling of inspections for initial installations of accessible building elements (such as grab bars, sinks, dispensers, etc.) to avoid relocating of elements for code compliance. The same is true for items such as handrails, guards, required signage, etc.

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OSFM Required Inspections

Inspections are to be e-mailed to OSBI.Inspections@ct.gov for the installation of systems such as but not limited to;

- ***Automatic sprinkler systems (NFPA 13)***
  - Hydrostatic Tests: Aboveground and underground piping.
  - Air Tests: Dry pipe systems.
  - System Operational Test: Water flow devices (audible alarm within 5minutes after flow begins).
  - Pressure Reducing Valves: Proper operation under flow and no flow conditions.
  - Backflow Prevention Assemblies: Forward flow test.

- ***Fire alarm and detection systems (NFPA 72)***
  - Written statement of completion.
  - Record of completion form.
  - Initial Acceptance Test.
  - Reacceptance Test where applicable.

- ***Fire pumps (NFPA 20)***
  - Suction and discharge piping shall be hydrostatically tested.
  - Suction piping shall be flushed
  - Installing contractor shall furnish a certificate of test prior to the start of the acceptance test.
  - Present at the test shall be the pump, engine, controller mfg, and the transfer switch mfg.
  - Test procedures shall be found in NFPA 20

- ***Stand pipe systems (NFPA 14)***
  - Test shall be conducted on the water distribution system.
  - Complete and sign appropriate contractors material and test certificate.
  - Underground piping supplying the system shall be flushed in accordance with NFPA 24.
  - All hose connections and fire department connections shall be tested for compatibility.
  - Hydrostatic test all new systems.
  - Hydrostatic test all new piping in existing systems that are modified.

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- ***Emergency generators (NFPA 110)***
  - Acceptance test shall be conducted after completion of the installation with all EPSS accessory and support equipment in place and operating.
  - Onsite installation test shall be conducted in accordance with section 7.13.4.1 (steps 1-13)
  - Additional requirements shall be followed as indicated in sections 7.13.5 – 7.13.11.
  - Additional documentation required: see 7.13.11.
  - Evidence of the prototype test as specified in 5.2.1.2.
  - A certified analysis as specified in 5.6.10.2.
  - A letter of compliance as specified in 5.6.10.5.
  - A manufacturer certification of a rated load test at rated power factor with ambient temperature, altitude, and fuel grade recorded.

- ***Temporary heating systems***
- ***Hazardous Materials***
- ***L.P. & Natural Gas systems***
- ***Alternative suppression systems***
- ***Cooking suppression systems***

This list does not relieve the owner/contractor/designer from complying with <u>all</u> the requirements of the referenced documents of the Connecticut State Fire Safety Code and the Connecticut State Fire Prevention Code. Refer to the specific legally adopted NFPA standard for the complete requirements for installation, design, and testing.

A complete listing of referenced standards can be found in Chapter 2 of the Connecticut State Fire Safety Code and Connecticut State Fire Prevention Code.

Regulations of Connecticut State Agencies

OSBI/OSFM INSPECTION REQUEST & REPORT

All inspections require 48-hour notice and shall be e-mailed to: OSBI.Inspections@ct.gov

(This portion to be completed by Construction Administrator)

Project Name: Click here to enter text.

Building Permit No.: Click here to enter text. Project No: Click here to enter text.

Date of Request Inspection: Click here to enter a date. Time: Click here to enter text.

Requested by: Click here to enter text.

Areas to be inspected: Click here to enter text.

☒ Pre-inspection conducted by construction administrator. (Initials): Click here to enter text.

(OSBI Use only below this line)

☐ INSPECTION ☐ RE-INSPECTION RE-INSPECTION NO.:	INSPECTION DATE: INSPECTED BY:
ISSUE DATE:	ISSUED TO:

INSPECTION SUMMARY (Select all that apply)

☐ **APPROVED**	Close area. No further action required.
☐ **PARTIALLY APPROVED**	List approved locations in comments below.
☐ **FAILED**	Remedial work indicated. Re-inspection required.*
☐ **ABORTED**	Area not ready for inspection. Re-inspection required.*
☐ **INFORMATION REQUIRED**	For conducting inspection. (Specify below.)
☐ **OTHER**	Specify below.
☐ **ATTACHMENTS**	Additional report logs attached; i.e., fire damper, pipe test, etc.

*The number of re-inspections will be tracked for OSBI use.

ADDITIONAL EXPLANATORY COMMENTS: See back of form.

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Connecticut State University System

Central Connecticut State University
Eastern Connecticut State University
Southern Connecticut State University
Western Connecticut State University
System Office

STANDARD TERMS AND CONDITIONS

I. DEFINITIONS

The following words, when used herein, shall have the following meanings:

1. "Contract" shall mean any agreement negotiated by and between CSU and the contractor selected by CSU as the result of a request for proposal, request for quotation, or request for bid, including, but not limited to, a personal service agreement or purchase order.
2. "CSU" shall refer to the Connecticut State University System, which is comprised of Central Connecticut State University, Eastern Connecticut State University, Southern Connecticut State University, Western Connecticut State University and the System Office, collectively and individually, as the context requires.
3. "Person" shall mean an individual, partnership, corporation or other business entity, as the context requires.
4. "Proposal" shall mean a response to a request for proposal, request for bid, or request for quotation.
5. "Proposer" shall mean a contractor that submits a response to a request for proposal, request for bid, or request for quotation.
6. "RFP" shall mean a request or invitation for proposal, bid, or quotation, as applicable.

II. TERMS AND CONDITIONS RELATED TO REQUESTS FOR PROPOSALS

A. General Conditions

1. CSU reserves the right to amend or cancel an RFP prior to the date and time for the opening of proposals. CSU, in its sole discretion, reserves the right to accept or reject any and all proposals, in whole or in part, and to waive any technicality in any proposal submitted, and to accept any part of a proposal deemed to be in the best interest of CSU.
2. Proposals received from proposers debarred by the State of Connecticut will not be considered for award.
3. CSU does not commit to specific volumes of activity, nor does it guarantee the accuracy of statistical information provided in the RFP. Such information is supplied to proposers for reference only.
4. All responses to the RFP shall be and remain the sole property of CSU.
5. Each proposer shall bear all costs associated with proposer's response to an RFP, including, but not limited to, the costs of any presentation and/or demonstration required by CSU. In addition, answers or clarifications sought by CSU arising out of or in connection with the proposal shall be furnished by the proposer at the proposer's expense.
6. CSU reserves the right to negotiate, as it may deem necessary, with any or all of the proposers that submit proposals.
7. Any alleged oral agreement or arrangement made by any proposer with CSU or any employee thereof shall not be binding.

B. Submission of Proposals

1. Proposals must be submitted on forms supplied by CSU. Telephone, facsimile, or email proposals will not be accepted in response to an RFP.
2. The time and date proposals are to be received and opened are stated in each RFP issued by CSU. Proposals received in the applicable CSU purchasing department after the date and time specified in the RFP will be returned to the proposer unopened. Proposal amendments received by CSU after the time specified for opening of proposals shall not be considered.
3. All proposals must be addressed to the location designated in the RFP. Proposal envelopes must clearly state the proposal number as well as the date and time of the opening of the proposals, as stated in the RFP. The name and address of the proposer must appear in the upper left hand corner of the envelope.
4. Proposals must be computer prepared, typewritten or handwritten in ink. Proposals submitted in pencil will be rejected.
5. Proposers must answer all the questions set forth in the RFP using the outline and numbering scheme set forth therein. Proposers must furnish all information requested in the RFP and supply all materials required for consideration. Failure of the proposer to answer all questions and supply all information and materials requested may be grounds for rejection of the proposal.
6. All proposals must be signed by a person duly authorized to sign proposals on behalf of the proposer. All signatures on the proposal must be original. Proposals bearing stamp signatures will be rejected. Unsigned proposals will be rejected.
7. Alterations or corrections to the proposal must be initialed by the person signing the proposal or his or her authorized designee. All initials on alterations or corrections to the proposal must be original. In the event that an authorized designee initials an alteration or correction, the proposer must submit a written authorization from the proposal's signatory to the authorized designee, authorizing the designee to make the alteration or correction. Failure to submit such an authorization shall result in rejection of proposal as to those items altered or corrected and not initialed.

8. Conditional proposals are subject to rejection in whole or in part, in the sole discretion of CSU. A conditional proposal is defined as one that limits, modifies, expands or supplements any of the terms and conditions and/or specifications of the RFP.
9. Alternate proposals will not be considered by CSU, unless otherwise noted on the RFP or on the proposal form. An alternate proposal is defined as one that is submitted in addition to the proposer's primary response to the RFP.
10. CSU does not sponsor any one manufacturer's products, but lists equipment by name and model number to designate the quality and performance level desired. Proposers may propose substitutes similar in nature to the equipment specified. The substitute must, in the sole determination of CSU, be equal in quality, durability, appearance, strength and design to the equipment or product specified in the RFP, or offer a clear advantage to CSU because of improved or superior performance. All proposals including equipment or product substitutes must be accompanied with current descriptive literature on, and data substantiating, the equal or superior nature of the substitute. All final decisions concerning substitutes will be made by CSU prior to any award. The word substitute shall not be construed to permit substantial departure from the detailed requirements of the specifications.
11. Each proposer's prices must be firm for a period up to 120 days from date of the opening of proposals. Prices must be extended in decimal, not fraction, must be net, and must include transportation and delivery charges, fully prepaid by the contractor, to the destination specified in the proposal, and subject only to cash discount.

12. Pursuant to Section 12-412 of the Connecticut General Statutes, the State of Connecticut is exempt from the payment of excise, transportation and sales taxes imposed by the Federal Government and/or the State. Accordingly, such taxes must not be included in proposal prices.
13. If there is a discrepancy between a unit price and an extended price, the unit price will govern.
14. By submitting a proposal, the proposer asserts that the offer and information contained therein is in all respects fair and without collusion or fraud and was not made in connection with any competing proposer's submission of a separate response to the RFP. By submitting a proposal, the proposer further asserts that it neither participated in the formation of CSU's solicitation development process nor had any knowledge of the specific contents of the RFP prior to its issuance, and that no employee of CSU participated directly or indirectly in the preparation of the proposer's proposal.
15. It is the proposer's responsibility to check the website of the State of Connecticut Department of Administrative Services (www.das.state.ct.us/Purchase/Portal/Portal_Home.asp) for changes prior to the proposal opening. It is the responsibility of the proposer to obtain all information related to proposal submission including, without limitation, any and all addenda or supplements required.
16. Any person contemplating submitting a proposal who is in doubt as to the true meaning of, or is in need of clarification of, any part of the RFP or the specifications set forth therein, must submit a written request for clarification to CSU. The proposer may rely only upon a response to a request for clarification set forth in writing by CSU.
17. Proposals for the provision of services must include the cost of obtaining all permits, licenses, and notices required by the city or town in which the services is to be provided, and the State and Federal governments..
18. Each proposer must complete and submit with its proposal the following non-discrimination and affirmative action forms: the Notification to Proposers, Contract Compliance, and EEO-1. It shall not be sufficient to declare or state that such forms are on file with the State of Connecticut. Failure to include the required forms shall result in rejection of the proposal.

C. Samples

1. Samples, when required by the RFP, must be submitted strictly in accordance with the requirements of the RFP.
2. Any and all required samples shall be furnished by the proposer at no cost to CSU. All samples, unless otherwise indicated, will become the property of CSU and will not be returned to the proposer unless the proposer states in the proposal that the sample's return is requested. A sample will be returned on the request of the proposer if the sample has not been rendered useless or beyond its useful life. The proposer must pay the costs associated with the return of any sample. Samples may be held by CSU for comparison with actual product deliveries.
3. The making of chemical and physical tests of samples submitted with proposals shall be made in the manner prescribed by CSU.

D. Bonding Requirements / Guaranty or Surety

1. If required by this RFP, the proposal must be accompanied by a bid bond or a certified check in an amount that is ten percent (10%) of the bid amount. The bid bond must be executed by an insurance company licensed to do business in the State of Connecticut. Certified checks must be made payable to CSU or the appropriate CSU University.
2. The proposal bond must be executed by the proposer as follows:
   (a) If the proposer is a corporation - must be signed by an official of the corporation above his or her official title, and the corporate seal must be affixed over the signature;
   (b) If the proposer is a partnership - must be signed by a general partner;
   (c) If the proposer is an individual - must be signed by the individual and indicate that he or she is "doing business as . . . ."
3. The surety company executing the bond or countersigning must be licensed in Connecticut and the bond must be signed by an official of the surety company with the corporate seal affixed over his or her signature. Signatures of two witnesses for both the principal and the surety must appear on the bond.

III. CONTRACT AWARD

1. All proposals properly submitted will be opened and read publicly. Upon award, the proposals are subject to public inspection. CSU will not prepare abstracts of proposals received for distribution, nor will information concerning the proposals received be conveyed by telephone.
2. Award will be made to the lowest responsible qualified proposer who complies with the proposal requirements. Price alone need not be the sole determining factor for an award. Other criteria, listed in the RFP, may be considered by CSU in the award determination.
3. CSU reserves the right to grant an award and/or awards by item, or part thereof, groups of items, or all items of the proposal and to waive minor irregularities and

omissions if, in CSU's judgment, the best interests of CSU or the State of Connecticut will be served.

4. CSU reserves the right to correct inaccurate awards resulting from its administrative errors.
5. The Award Notice and Offer (to enter into a formal contract) shall be sent to the awarded proposer by first class certified mail, return receipt requested, to the address provided in the awarded proposal, or by overnight courier. The Notice and Offer shall constitute an offer by CSU to enter into negotiations to come to a formal contract agreement. If the proposer, within ten (10) business days of receipt of said Notice and Offer, declines to begin contract negotiations, then the offer to negotiate a contract may be withdrawn and an offer to negotiate a contract extended to the next lowest responsible qualified proposer, and so on until a contract is negotiated and executed.
6. Each proposal submitted shall constitute an offer by the proposer to furnish any or all of the commodities or services described therein at the prices given and in accordance with conditions set forth in the proposal, the RFP, and these "Standard Terms and Conditions." Acceptance and resulting contract formation shall be in a formal written document authorized by CSU's Purchasing Department and where applicable, approved by the Attorney General, and shall comprise the entire agreement between the proposer and CSU.

IV. TERMS AND CONDITIONS RELATED TO CONTRACT WITH SUCCESSFUL PROPOSER

By submitting a response to the RFP, the proposer agrees that any contract negotiated between it (if the successful proposer), as contractor, and CSU may contain the following provisions, as deemed applicable by CSU:

A. General Conditions

1. Any product developed and accepted by CSU under a contract awarded as a result of an RFP shall be sole property of CSU, unless stated otherwise in the contract.
2. Data collected or obtained by the contractor in connection with the performance of the contract shall not be shared with any third party without the express written approval of CSU.
3. The contractor shall defend, indemnify and hold harmless CSU, its officers and employees, against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, monetary loss, interest, attorney's fees, costs and expenses of whatsoever kind or nature arising out of the performance of the agreement, including those arising out of injury to or death of contractor's employees or subcontractors, whether arising before, during or after completion of the services thereunder and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence of contractor or its employees, agents or subcontractors. Without limiting the foregoing, the contractor shall defend, indemnify and hold CSU and the State of Connecticut harmless from liability of any kind for the use of any copyright or un-copyrighted composition, secret process, patented or unpatented invention furnished or used in the performance of the contract. This indemnification shall be in addition to the warranty obligations of the contractor and shall survive the termination or cancellation of the contract or any part thereof.
4. The contactor shall: (i) guarantee its products against defective materials and workmanship; (ii) repair damage of any kind, for which it is responsible, to CSU's premises or equipment, to its own work or to the work of other contractors; (iii) obtain and pay for all applicable licenses, permits, and notices; (iv) give all notices and comply with all requirements of the municipality in which the service is to be provided and of the State and federal governments; and (v) carry proper and sufficient insurance to protect the State from loss.
5. The contract shall be interpreted and governed by the laws of the State of Connecticut, without regard to its principles of conflicts of laws.
6. The contractor agrees that it shall be subject to and abide by all applicable federal and state laws and regulations.
7. The contractor agrees that it shall comply with Section 4a-60 of the Connecticut General Statutes and with Executive Orders Nos. 3, 16, 17 and 7B.
8. The contractor agrees that the sole and exclusive means for the presentation of any claim against the State of Connecticut, the Connecticut State University or the Board Of Trustees arising from a contract with CSU, shall be in accordance with the provisions of Chapter 53 of the Connecticut General Statutes (Claims Against the State) and that no additional legal proceedings will be initiated in any state or federal court in addition to, or in lieu of, said Chapter 53 proceedings.
9. The contractor agrees that CSU shall have and retain sole and exclusive right and title in and to the forms, maps, and/or materials produced for CSU pursuant to the contract, including all rights to use, distribute, sell, reprint, or otherwise dispose of same. The contractor further agrees that it shall not copyright, register, distribute, or claim any rights in or to said maps and/or materials or the work produced under the contract.
10. The contractor or subcontractor, as applicable, shall offer and agree to assign to CSU all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act, 15 U.S.C. 15, or under Chapter 624 of the general statutes, arising from the purchase of services, property or intangibles of any kind pursuant to a public purchase contract or subcontract; such assignment shall be made and become effective at the time the contract is executed by the parties, without further acknowledgment by them.
11. The contractor shall not assign or otherwise dispose of the contract or its right, title or interest therein, or its power to execute such contract, to any other person without the prior written consent of CSU.
12. CSU reserves the right to inspect commodities for conformance with proposal specifications. When commodities are rejected by CSU, said commodities shall be removed by the contractor, at the contractor's expense, from the CSU premises within forty-eight (48) hours after notification of such rejection, unless public health and safety require immediate destruction or other disposal of such rejected delivery. Rejected items left longer than forty-eight (48) hours shall be considered abandoned by the contractor and CSU shall have the right to dispose of them as its own property.
13. If any provision, term or condition of the contract is prohibited, invalid, or unenforceable then that provision, term or condition shall be ineffective to the extent of the prohibition, invalidity, or prohibition without invalidating the remaining provisions, terms and conditions unless it materially alters the nature or intent thereof.
14. Should the terms of any purchase order or invoice issued in connection with the contract conflict with the

terms of the contract, the terms of the contract shall prevail.

15. Failure of the contractor to deliver commodities or perform services as specified in the contract will constitute authority for CSU to purchase these commodities or services on the open market. The contractor shall promptly reimburse CSU for excess costs incurred by CSU due to these purchases, and these purchases shall be deducted by CSU from the quantities contracted for.
16. No right or duty, in whole or in part, of the contractor under the contract may be assigned or delegated without the prior written consent of CSU. The subcontracting or assignment of any of contractor's obligations under the contract to a subcontractor shall require the prior written approval of CSU.
17. Upon termination of the contract by CSU, the contractor shall both immediately discontinue all services (unless the notice directs otherwise) and deliver to CSU all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the contractor in performing its duties under the contract, whether completed or in progress. All such documents, information, and materials shall become the property of CSU.
18. The State of Connecticut shall assume no liability for payment for services under the terms of the contract until the contractor is notified that the contract has been accepted by CSU and, if applicable, approved by the Office of Policy and Management ("OPM") or the Department of Administrative Services ("DAS") and by the Attorney General of the State of Connecticut.

B. Insurance

1. Before commencing to perform services pursuant to the contract, the contractor shall obtain, at its own cost and for the duration of the contract, the following insurance:
   (a) Commercial General Liability: $1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. Coverage shall include Premises and Operations, Independent Contractors, Products and Completed Operations, Contractual Liability and Broad Form Property Damage coverage. If a general aggregate is used, the general aggregate limit shall apply separately to the project or the general aggregate limit shall be twice the occurrence limit.
   (b) Automobile Liability: $1,000,000 combined single limit per accident for bodily injury. Coverage extends to owned, hired and non-owned automobiles. If the contractor does not own an automobile, but one is used in the execution of the contract, then only hired and non-owned coverage is required. If a vehicle is not used in the execution of the contract then automobile coverage is not required.
   (c) Professional Liability: $1,000,000 limit of liability.
   (d) Workers' Compensation and Employers Liability: Statutory coverage in compliance with the laws of the State of Connecticut. Coverage shall include Employer's Liability with minimum limits of $100,000 each accident, $500,000 Disease – Policy limit, $100,000 each employee.
   An Excess Liability/Umbrella Policy may be used to meet the minimum limit guidelines.
2. The contractor shall provide copies of its Certificates of Insurance to CSU, if requested to do so. The Certificates shall include the following:
   (a) The certificate shall clearly identify the State of Connecticut, its officers, officials, employees, agents, boards and commissions as Additional Insured. The coverage shall contain no special limitations on the scope of protection afforded to the State.
   (b) The certificate shall clearly indicate the project name and project number or some easily identifiable reference to the relationship to the State.
3. The Certificates shall be signed by a person authorized by that insurer to execute contracts on its behalf. The certificate Accord Form 25 Certificate shall indicate a minimum thirty (30) day endeavor to notify requirement in the event of cancellation or non-renewal of coverage.
4. The contractor shall assume responsibility for payment of any and all deductibles applicable to the insurance policies described in Section IV.B.1 above.
5. The contractor's insurer shall have no right of recovery or subrogation against the State and the described insurance shall be primary coverage.
6. Each required policy of insurance shall provide that it shall not be suspended, voided, cancelled or reduced except after thirty (30) days' prior written notice sent by certified mail to CSU.
7. "Claims Made" coverage shall be unacceptable, with the exception of Professional Liability.

C. Bonds

The successful proposer shall submit the following bonds, at the request of CSU, within ten (10) days of the date of receipt of the Award Notice and Offer:

1. A Performance Bond in the amount of one hundred percent (100%) of the total proposal price; and

2. A Labor and Material Payment Bond in the amount of one hundred percent (100%) of the total proposal price.

A company authorized to transact business in the State of Connecticut shall execute the bonds. Checks shall be made payable to CSU or the appropriate CSU University.

D. Delivery

1. Unless otherwise specified in the proposal, all products and equipment delivered pursuant to the contract shall be new and shall include any and all manufacturer's warranties.
2. Delivery shall be to the point specified in the contract.
3. All deliveries shall display, in plain sight, any related Purchase Order or Reference/Delivery Number. Failure to display said number may cause the shipment to be rejected and returned at the contractor's expense.
4. All deliveries shall be in compliance with Sections 22a-194 to 22a-194g of the Connecticut General Statutes related to product packaging.
5. Deliveries shall be subject to reweighing on official sealed scales designated by the State and payment shall be made on the basis of net weight of materials received.
6. Payment terms are net forty-five (45) days after receipt of goods or invoice, whichever is later. State of Connecticut certified small or minority contractors are payable under terms net thirty (30) days.
7. Monies owed to CSU or the Department of Revenue Services (DRS) by the contractor shall be deducted from current obligations.

E. Inspection and Tests

1. The inspection of all commodities and the making of chemical and physical tests of samples of deliveries to determine whether or not the contract specifications are being complied with shall be made in the manner prescribed by CSU.
2. Any item that fails in any way to meet the terms or specifications set forth in the contract is subject to be paid for at an adjusted price or rejected, in the discretion of CSU.
3. After delivery and installation of any equipment provided pursuant to the contract, the contractor shall certify to CSU that the equipment has been properly installed and is ready for use. Thereafter, for a test period of sixty (60) days, CSU shall operate the system in accordance with its normal operating practices. The acceptance test shall determine if the equipment's operating characteristics meet the performance standards set forth in the contract.

F. Advertising

Reference by the contractor to sales to CSU for advertising and promotional purposes without the prior approval of CSU shall be expressly prohibited.

TERMS/CONDITIONS

EXECUTIVE ORDERS

This Agreement is subject to the provisions of Executive Order No. 3 of Governor Thomas J. Meskill promulgated June 16, 1971, and, as such, this Agreement may be canceled, terminated or suspended by the State Labor Commissioner for violation of or noncompliance with said Executive Order No. 3, or any state or federal law concerning nondiscrimination, notwithstanding that the Labor Commissioner is not a party to this contract. The parties to this Agreement, as part of the consideration hereof, agree that said Executive Order No. 3 is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the State Labor Commissioner shall have continuing jurisdiction in respect to contract performance in regard to nondiscrimination, until the contract is completed or terminated prior to completion. The contractor, agrees, as part consideration hereof, that this Agreement is subject to the Guidelines and Rules issued by the State Labor Commissioner to implement Executive Order No. 3, and that he will not discriminate in his employment practices or policies, will file all reports as required, and will fully cooperate with the State of Connecticut and the State Labor Commissioner. This Agreement is also subject to provisions of Executive Order No. 17 of Governor Thomas J. Meskill promulgated February 15, 1973, and, as such, this Agreement may be canceled, terminated or suspended by the contracting agency or the State Labor Commissioner for violation of or noncompliance with said Executive Order No. 17, notwithstanding that the Labor Commissioner may not be a party to this Agreement. The Parties to this Agreement, as part of the consideration hereof, agree that Executive Order No. 17 is incorporated herein by reference and made a part hereof. The Parties agree to abide by said Executive Order and agree that the contracting agency and the State Labor Commissioner shall have joint and several continuing jurisdiction in respect to contract performance in regard to listing all employment openings with the Connecticut State Employment Service. This contract is also subject to Executive Order Number 16 of Governor John G. Rowland promulgated August 4, 1999, and as such, the Agreement may be canceled, terminated or suspended by the state for violation of or noncompliance with said Executive Order No. 16. The Parties to this Agreement, as part of the consideration hereofm agree that (a) The Contractor shall prohibit as a condition of employement, any weapon or dangerous instrument defined in (b): (b) Weapon means any firearm, including BB gun, whether loaded or unloaded, any knife (excluding a small pen of pocket knife), including a switchblade or other knife having an automatic spring release device, a stiletto, any police baton or nightstick or any martial arts weapon or electronic defence weapon. Dangerous instrument means any instrument, article, or substance that, under the circumstances, is capable of causing death or serious physical injury. (c) The Contractor shall prohibit employees from attempting to use, or threaten to use, any such weapon or dangerous instrument in the state work site and employees shall be prohibited from causing, or threatening to cause, physical injury or death to any individual in the state work site. (d) The Contractor shall adopt the above prohibition as work rules, violation of which shall subject the employee to disciplinary action up to and including discharge. The Contractor shall insure and require that all employees are aware is such work rules. (e) The contractor agrees that any subcontract it enters into in furtherance of the work to be performed hereunder shall contain provisions (a) through (d) of this Section. This Agreement is subject to Executive Order No 7B of Governor Jodi M. Rell, promulgated on November 16, 2005. The Parties to this Agreement, as part of the consideration hereof, agree that :(a.) The State Contracting Standards Board ("the Board") may review this contract and recommend to the state contracting agency termination of the contract for cause. The state contracting agency shall consider the recommendations and act as required or permitted in accordance with the contract and applicable law. The Board shall provide the results of its review, together with its recommendations, to the state contracting agency and any other affected party in accordance with the notice provisions in the contract no later than fifteen (15) days after the Board finalizes its recommendation. For the purposes of this Section, "for cause" means: (1.) a violation of the State Ethics Code (Conn. Gen. Stat. Chapter 10) or Section 4A-100 of the Conn. Gen. Statutes or (2.) wanton or reckless disregard of any state contracting and procurement process by any person substantially involved in such contract or state contracting agency. (b.) For the purposes of this Section, "contract" shall not include real property transactions involving less than a fee simiple interest or financial assistance comprised of state or federal funds, the form of which may include but is not limited to grants, loans, loan guarantees, and participation interests in loans, equity investments and tax credit programs. Notwithstanding the foregoing, the Board shall not have any authority to recommend the termination of a contract for the sale or purchase of a fee simple interest in real property following transfer of title. (c.) Effective January 1, 2006, notwithstanding the contract value listed in Conn. Gen. Stat. 4-250 and 4-251, all procurements between state agencies and private entities with a value of $50,000 (fifty thousand dollars) or more in a calendar or fiscal year shall comply with the gift affidavit requirements of said Sections. Certification by agency officials or employees required by Conn. Gen. Stat. 4-252 shall not be affected by this Section.

NON-DISCRIMINATION

(a) For the purposes of this section, "minority business enterprise means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Conn. Gen. Stat. 32-9n; and good faith means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. Good faith efforts shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.

For purposes of this section, Commission means the Commission on Human Rights and Opportunities.

For purposes of this section, Public works contract means any agreement between any individual, firm or corporation and the state or any political subdivision of the state other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including but not limited to, matching expenditures, grants, loans, insurance or guarantees.

(b) (1) The Contractor agrees and warrants that in the performance of the contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation or physical disability, including but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut. The Contractor further agrees to take affirmative action to insure that applicants with job related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation, or physical disability, including but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor agrees to comply with each provision of this section and Conn. Gen. Stat. 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Conn. Gen. Stat. 46a-56, 46a-68e and 46a-68f; (5) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this section and section 46a-56. If the contract is a public works contract, the Contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

(c) Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: the Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

(d) The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.

(e) The Contractor shall include the provision of subsection (b) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Conn. Gen. Stat. 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

(f) The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this contract and as they may be adopted or amended from time to time during the term of this contract and any amendments thereto.

(g) The contractor agrees to the following provisions: The contractor agrees and warrants that in the performance of the agreement such Contractor will not discriminate or permit discrimination against any persons or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; the Contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; the Contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said commission pursuant to Section 46a-56 of the general statutes; the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of this section and Section 46a-56 of the general statues.

(h) The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligations of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Section 46a-56 of the general statutes; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter

INSURANCE

The contractor agrees that while performing services specified in the agreement that he shall carry sufficient insurance (liability and/or other) as applicable according to the nature of the service to be performed so as to "save harmless" the State of Connecticut from any insurable cause whatsoever. If requested, certificates of such insurance shall be filed with the contracting State agency prior to the performance of services.

STATE LIABILITY

The State of Connecticut shall assume no liability for payment for services under the terms of this agreement until the contractor is notified that this agreement has been accepted by the contracting agency and, if applicable, approved by the Office of Policy and Management (OPM) or the Department of Administrative Services (DAS) and by the Attorney General of the State of Connecticut.

General Conditions of the Contract for Construction
Department of Public Works
State of Connecticut

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ARTICLE 1
DEFINITIONS

WHENEVER THE FOLLOWING TERMS, OR PRONOUNS IN PLACE OF THEM, ARE USED THE INTENT AND MEANING SHALL BE AS FOLLOWS:

1.1 ACCEPTANCE: The Owner's acknowledgement of the Work from the Contractor upon certification by the Construction Administrator and Architect or Engineer that all Work has been completed.

1.2 ADDITIONAL OR DELETED WORK: Work required by the Department that, in the judgment of the Commissioner, involves any addition to, deduction from, or modification of the Work required by the Contract Documents.

1.3 AGENCY: The (User) Agency of the State of Connecticut having administrative authority of the facility in which the Work is being performed.

1.4 APPLICATION FOR PAYMENT, PARTIAL PAYMENT OR REQUISITION: Contractor's certified request for payment for completed portions of the Work and, if the Contract so provides, for materials or equipment suitably stored pending their incorporation into the Work.

1.5 ARCHITECT OR ENGINEER: A sole proprietor, partnership, firm, corporation or other business organization under Contract with the Owner, commissioned to prepare Contract Drawings and Specifications, to advise the Owner and in certain cases, to perform regular inspections during construction and when authorized to perform the duties of the Construction Administrator.

1.6 AS-BUILT DRAWINGS: Construction Drawings revised by the Contractor to show all significant Modifications made during the construction process.

1.7 BASE BID: Monetary value stated in the Bid Proposal Form as the sum for which the Bidder offers to perform the Work described in the Bidding Documents, exclusive of adjustments for Supplemental Bids.

1.8 BID BOND: Form of Bid Security executed by the Bidder as Principal and by a Surety to guarantee that the Bidder will enter into a Contract within a specified time and furnish any required bond as mandated by Connecticut General Statute Section 4b-92.

1.9 BIDDER: A sole proprietor, partnership, firm, corporation or other business organization submitting a Bid on the Bid Proposal Form for the Work contemplated.

1.10 BIDDING DOCUMENTS: Collectively, the Bidding Requirements and the proposed Contract Documents, including any addenda issued prior to receipt of Bids.

1.11 BID OR BID PROPOSAL FORM: A complete and duly signed proposal to perform Work (or a designated portion thereof) for a stipulated sum submitted in accordance with the Bidding Documents.

1.12 BID SECURITY: Certified check or Bid Bond submitted with Bid Proposal Form, which provides that the Bidder, if awarded the Contract, will execute such Contract in accordance with the requirements of the Bidding Documents.

1.13 BUILDER'S RISK INSURANCE: A specialized form of property insurance which provides coverage for loss or damage to the Work pursuant to the Contract Documents.

1.14 CASH ALLOWANCE: An amount established in the Contract Documents for inclusion in the Contract Sum to cover the cost of prescribed items not specified in detail, and as shown in the Allowance Schedule.

1.15 CERTIFICATE OF ACCEPTANCE: A document issued by the Owner to the Contractor stating that all Work specified in the Certificate of Acceptance has been completed and accepted by the Owner.

1.16 CERTIFICATE OF COMPLIANCE: A document stating that for the portion of the Project completed, either the design portion or the construction portion, has been performed in substantial compliance with all applicable building codes.

1.17 CERTIFICATE OF OCCUPANCY: Document issued by the authority having jurisdiction certifying that all or a designated portion of a building is approved for its designated use.

1.18 CERTIFICATE OF SUBSTANTIAL COMPLETION: A document prepared by the Architect or Engineer and approved by the Owner on the basis of an inspection stating:

- **1.18.1** that the Work, or a designated portion thereof, is determined to be Substantially Complete;
- **1.18.2** the date of Substantial Completion;
- **1.18.3** the responsibilities of the Owner and the Contractor for security maintenance, heat, utilities, damage to the Work and insurance; and
- **1.18.4** the time within which the Contractor shall complete the remaining Work.

1.19 CHANGE ORDER: Written authorization signed by the Owner, authorizing a modification in the Work, an adjustment in the Contract Sum, or an adjustment in the Contract Time.

1.20 COMMISSIONER: The State of Connecticut, Department of Public Works (DPW) Commissioner acting directly or through specifically authorized DPW personnel or agent(s) having authority to perform duties defined in Article 25.

1.21 CONSTRUCTION ADMINISTRATOR: A sole proprietor, partnership, firm, corporation or other business organization, under Contract or employed by the Owner commissioned and/or authorized to oversee the fulfillment of all requirements of the Contract Documents. The authorized Construction Administrator may be a Department of Public Works Assistant Project Manager, Department of Public Works Project Manager, a Clerk of the Works, an Architect, a Consulting Architect, a Consulting Construction Administrator, a Consulting Engineer etc. or any other designee as authorized and identified by the Owner.

1.22 CONSTRUCTION CHANGE DIRECTIVE: A written authorization signed by the Owner, directing a modification in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum, Contract Time or both. Any Construction Change Directive effecting an adjustment to the Contract Sum or Contract Time shall result in a Change Order.

1.23 CONTRACT DOCUMENTS OR CONTRACT: The Agreement between Owner and Contractor, Conditions of the Contract (General Conditions, Supplementary Conditions, General Requirements and other Conditions), Drawings, Specifications, and Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract, all of which shall constitute the Contract.

1.24 CONTRACTOR OR GENERAL CONTRACTOR: A sole proprietor, partnership, firm or Corporation, under direct Contract with the Department of Public Works, responsible for performing the Work under the Contract Documents. Whenever the words "Contractor" or "General Contractor" are used it shall be understood to mean Contractor.

1.25 CONTRACTOR'S LIABILITY INSURANCE: Insurance purchased and maintained by the Contractor that insures the Contractor for claims for property damage, bodily injury or death.

1.26 CONTRACT START DATE OR DATE OF COMMENCEMENT OF THE WORK: The date, specified by the Owner in the Notice to Proceed, on which the Contractor is required to start the Work.

1.27 CONTRACT SUM: The sum stated in the Contract, which is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

1.28 CONTRACT TIME: The period of time allotted in the Contract Documents for Substantial Completion of the Work, including authorized adjustments thereto. The Contract Time is the sum of all Working Days and Non-Working Days as further defined herein and specified in the Contract Documents.

1.29 DAY: Whenever the word Day is used it shall be understood to mean calendar day stated on the Bidding Documents, unless stated otherwise.

1.30 DEPARTMENT OF PUBLIC WORKS (DPW) PROJECT MANAGER: The individual employed by the Owner, designated and authorized by the Commissioner, to be responsible for the overall management and oversight of the Project, and to represent the (User) Agency.

1.31 DIESEL VEHICLE EMMISSIONS CONTROL: The reduction of air pollution emissions from diesel powered vehicles through the use of diesel engine emission control technologies.

1.32 EQUAL(S): Any deviation from the Specification which is defined as follows: A replacement for the specified material, device, procedure, equipment, etc., which is recognized and accepted as substantially equal to the first listed manufacturer or first listed procedure specified after review by the Architect/Engineer, and may be rejected or approved at the sole discretion of the Owner. All equals must be substantially equivalent to the first manufacturer or first procedure listed in the Specifications with reference to all of the following areas: the substance and function considering quality, workmanship, economy of operation, durability, and suitability for purposes intended; size, rating, and cost. The equal does not constitute a modification in the scope of Work, the Schedule, or Architect/Engineer's design intent of the specified material, device, procedure, equipment, etc.

1.33 FINAL INSPECTION: Review of the Work by the Architect or Engineer and Owner to determine whether Acceptance has been achieved.

1.34 FINAL PAYMENT: The last payment made by the Owner to the Contractor, made after notice of the Acceptance. Payment shall include the entire unpaid balance of the Contract Sum as adjusted by modifications.

1.35 GENERAL CONDITIONS: The General Conditions of the Contract for Construction, part of Division 00 of the Specifications.

1.36 GENERAL REQUIREMENTS: That part of the Contract Documents entitled General Requirements, which is Division 01 of the Specifications.

1.37 GUARANTEE: See Warranty.

1.38 LIQUIDATED DAMAGES: A sum established in a Contract, usually as a fixed sum per Day, as the predetermined measure of damages to be paid to the Owner due to the Contractor's failure to complete the Work within the Contract Time.

1.39 LUMP SUM: An item or category priced as a whole rather than broken down into its elements.

1.40 MOBILE SOURCE: A source designed or constructed to move from one location to another during normal operation except portable equipment and includes, but is not limited to, automobiles, buses, trucks, tractors, earth moving equipment, hoists, cranes, aircraft, locomotives operating on rails, vessels for transportation on water, lawnmowers, and other small home appliances.

1.41 NON-WORKING DAYS: All Saturdays, Sundays, Legal State Holidays (12), and any other Days identified in the Contract Documents that the Contractor is not permitted to execute the Work. The restriction of Non-Working Days may be suspended upon the approval or direction of the Commissioner.

1.42 NOTICE TO BIDDER: A notice contained in the Bidding Document informing prospective Bidders of the opportunity to submit Bids on a Project.

1.43 NOTICE TO PROCEED: Written notice, issued by the Commissioner or the Commissioner's authorized representative, to the Contractor authorizing the Contractor to proceed with the Work and establishing the date for commencement of the Contract Time.

1.44 OWNER OR DEPARTMENT: The State of Connecticut, Department of Public Works acting through its Commissioner or specifically authorized Department personnel or agent.

1.45 OVERHEAD: Indirect costs including: supervision (any position over the foreman), field and home office expense, insurance, and small tools and consumables.

1.46 PAYMENT, BOND, LABOR BOND OR MATERIAL BOND: A bond in which the Contractor and the Contractor's surety guarantee to the Owner that the Contractor will pay for labor and materials furnished for use in the performance of the Contract, as required by Connecticut General Statutes Section 49-41.

1.47 PERFORMANCE BOND OR SURETY BOND: A bond in which the Contractor and the Contractor's surety guarantee to the Owner that the Work will be performed in accordance with the Contract Documents, as required by Connecticut General Statutes Section 49-41.

1.48 PERFORMANCE SPECIFICATION: A description of the desired results or performance of a product, material, assembly, procedure, or a piece of equipment with criteria for identifying the standard.

1.49 PLANS OR DRAWINGS: All Drawings or reproductions of Drawings pertaining to the construction of the Work contemplated and its appurtenances.

1.50 PROJECT: The total construction of which the Work performed under the Contract Documents may be the whole or a part.

1.51 PROJECT MANUAL: The set of documents assembled for the Work which includes, but is not limited to, Contract Documents, Bidding Requirements, Sample Forms, Conditions of the Contract, General Requirements, and the Specifications.

1.52 PROPRIETARY SPECIFICATION: A specification that describes a product, procedure, function, material, assembly, or piece of equipment by trade name and/or by naming the manufacturer(s) or manufacturer's procedure, exact model number, item, etc., of those products acceptable to the Owner.

1.53 RETAINAGE: A percentage of each Application for Payment and a percentage of the total Contract Sum retained by the Owner.

1.54 SCHEDULE: A Critical Path Method (CPM) or Construction Schedule as required by the Contract Documents which shall be a diagram, graph or other pictorial or written Schedule showing all events expected to occur and operations to be performed and indicating the Contract Time, start dates, durations and finish dates as well as Substantial Completion and Acceptance of the Work, rendered in a form permitting determination of the optimum sequence and duration of each operation.

1.55 SCHEDULE OF VALUES: A document furnished by the Contractor to the Architect or Engineer and Owner stating the portions of the Contract Sum allocated to the various

portions of the Work, which is to be used for reviewing the Contractor's Applications for Payment.

1.56 SECONDARY SUBCONTRACTOR: A sole proprietor, partnership, firm or Corporation under direct Contract with the Subcontractor to the General Contractor.

1.57 SENSITIVE RECEPTOR SITES: Areas where concentrations of diesel emissions may be harmful to sensitive populations, including, but not limited to, hospitals, school and university buildings being occupied during a student semester, residential structures, daycare facilities, elderly housing, and convalescent facilities.

1.58 SHOP DRAWINGS: Drawings provided to Architect or Engineer and Owner by a Contractor that illustrate construction, materials, dimensions, installation, and other pertinent information for the incorporation of an element or item into the construction as detailed Contract Documents.

1.59 SPECIFICATIONS: The description, provisions and other requirements pertaining to the method and manner of performing the Work and/or to the quantities and quality of materials to be furnished under the Contract.

1.60 SUBCONTRACTOR: A sole proprietor, partnership, corporation or other business organization under direct Contract with the Contractor supplying labor and/or materials for the Work at the site of the Project.

1.61 SUBMITTALS: Documents including, but not limited to, samples, manufacturer's data, Shop Drawing, or other such items submitted to the Owner and Architect or Engineer by the Contractor for the purpose of approval or other action, as required by the Contract Documents.

1.62 SUBSTANTIAL COMPLETION: The stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents.

1.63 SUBSTITUTION: Any deviation from the specified requirements, which is defined as follows: A replacement for the specified material, device, procedure, equipment, etc., which is not recognized or accepted as equal to the first manufacturer or procedure listed in the Specification after review by the Architect/Engineer, and may be rejected or approved by the Owner. The Substitution is not equal to the specified requirement in comparison to the first manufacturer or first procedure listed in the Specifications in one or more of the following areas: the substance and function considering quality, workmanship, economy of operation, durability, and suitability for purposes intended; size, cost, and rating. The Substitution constitutes a modification in the scope of Work, the Schedule, or the Architect/Engineer's design intent of the specified material, device, procedure, equipment, etc.

1.64 SUPERINTENDENT: The Contractor's representative at the site who is responsible for continuous field supervision, coordination, in, completion of the Work, and, unless another person is designated in writing by the Contractor to the Owner and the Construction Administrator, for the prevention of accidents.

1.65 SUPPLEMENTAL BID: The monetary value stated in the Bid to be added to the amount of the Base Bid if the corresponding Work, as described in the Bidding Documents, is accepted.

1.66 SUPPLEMENTARY CONDITIONS: An extension in the Bid to be added to the amount of the Base Bid if the corresponding Work, as described in the Bidding Documents, is accepted.

1.67 SYSTEMS COMMISSIONING AUTHORITY (SCA): An independent entity under contract directly with the Owner or Owner's Representative responsible for performing the specified commissioning procedures.

1.68 THRESHOLD LIMIT BUILDING: Any proposed (new) structures or additions as defined by the Connecticut General Statutes Section 29-276b.

1.69 UNIT PRICE: The monetary value stated by the Owner or the Contractor, as a price per unit of measurement for materials or services as described in the Contract Documents and/or Bidding Documents.

1.70 WARRANTY: A written, legally enforceable assurance of specified quality or performance of a product or Work or of the duration of satisfactory performance.

1.71 WORK: The construction and services required by the Contract Documents, and including all labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

ARTICLE 2
CONDITIONS OF WORK

2.1 The Contractor shall carefully examine and study the conditions under which the Work is to be performed and the site of the Work, and compare the Contract Documents with each other and to information furnished by the Owner including but not limited to the Plans and Specifications, the form of the Contract, General Conditions, Supplementary Condi-

tions, General Requirements, Bonds and all other Contract Documents associated with the Work.

2.2 The Contractor shall report to the Construction Administrator all errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such errors, inconsistencies or omission and failed to report it to the Construction Administrator. If the Contractor performs any actions or construction activity knowing it involves an error, inconsistency or omission in the Contract Documents without notice to the Construction Administrator, the Contractor shall assume responsibility for such performance and related costs for the correction and shall not be allowed to submit any claim related to error, inconsistencies or omission.

2.3 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Construction Administrator at once; and it will be assumed that the Contractor has been satisfied as to all requirements of the Contract Documents. Any deterrent conditions at the site of the Work which are obvious and apparent upon examination of the site but are not indicated on the Plans shall be corrected by the Contractor without additional compensation.

2.4 In performing the Work, the Contractor must employ such methods or means as will not cause any interruption of or interference with the Work of any other Contractor, nor any inordinate disruption with the normal routine of the Owner, institution or Agency operating at the site.

2.5 No claims for additional compensation will be considered when additional costs result from conditions made known to, discovered by, or which should have been discovered by, the Contractor prior to Contract signing.

2.6 All Communications from the Contractor concerning proposed changes to the Contract Sum, Contract Time, or Work shall be in writing.

2.7 The Contractor shall perform the Work in accordance with the Contract Documents and approved Submittals pursuant to Article 5.

ARTICLE 3
CORRELATION OF CONTRACT DOCUMENTS

3.1 The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. Where discrepancies of conflict occur in the Contract Documents the following order of precedence shall be utilized:

3.1.1 Amendments and addenda shall take precedence over previously issued Contract Documents.
3.1.2 The Supplementary Conditions take precedence over the General Conditions.
3.1.3 The General Conditions take precedence over the General Requirements.
3.1.4 The Specifications shall take precedence over the Plans.
3.1.5 Stated dimensions shall take precedence over scaled dimensions.
3.1.6 Large-scale detail Drawings shall take precedence over small-scale Drawings.
3.1.7 The Schedules contained in the Contract Documents shall take precedence over other data on the Plans.

3.2 Neither party to the Contract shall take advantage of any obvious error or apparent discrepancy in the Contract Documents. The Contractor shall give immediate written notification of any error or discrepancy discovered to the Construction Administrator, who shall take the necessary actions to obtain such corrections and interpretations as may be deemed necessary for the completion of the Work in a satisfactory and acceptable manner. The Contractor shall then promptly proceed under the direction of the Owner and the provisions of Article 13. The Contractor's failure to provide immediate notice shall mean the Contractor will not be entitled to any additional compensation, either monetary or Contract Time adjustment, with respect to any discrepancy.

3.3 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

3.4 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings, shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

3.5 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

ARTICLE 4
COMMENCEMENT AND PROGRESS OF WORK

4.1 The Work shall start upon the date given in the Notice to Proceed. The Contractor shall complete all the Work necessary for Final Payment, including but not limited to Substantial Completion, Contract close-out, testing and demonstration of all systems as required for Acceptance, punchlist Work, training and submission of Record Documents, manuals, Guarantees and Warranties as stated in the Contract Document.

4.2 Time is of the ess ence with respect to the Contract Time. By executing the Contract, the Contractor confirms and agrees that the Contract Time is a reasonable period to perform the Work. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. The Contractor may, at his discretion, plan to complete the Work and achieve Substantial Completion in less time than the Contract Time.

4.3 The Contractor's early completion Schedule notwithstanding, the Owner reserves the right to order Modifications to the Work in accordance with Article 13 at any time during the Contract Time.

4.4 The Contractor shall not be entitled to costs for delay due to Owner ordered Modifications or any other circumstances for the period of time between the Contractor's elected early completion and the end of the Contract Time. Such costs include, but are not limited to, extended home office costs, field office costs, or supervisory and management costs incurred in performance of the Work. Early completion of the Work shall not merit additional compensation.

4.5 If the Contractor is delayed at any time in the progress of Work by acts of God, such as fire or flood or any action, injunction or stop order issued by any court, judge or officer of the court or any other court action beyond the Owner's control, then the Contract Time may be extended by Change Order for such reasonable time as demonstrated by the Contractor's Schedule and as the Owner may determine that such event has delayed the Work. In any event, the granting of an extension of time shall be solely within the discretion of the Owner.

4.6 Except as otherwise may be provided herein, extensions of time shall be the Contractor's sole remedy for such delay. No payment or compensation of any kind shall be made to the Contractor for damages because of hindrance in the orderly progress of Work caused by the aforesaid causes.

4.7 The Contractor acknowledges that the Contract amount includes and anticipates any and all delays, whether avoidable or unavoidable, from said orders, which may issue from any court, judge, court officer, or act of God, and that such delays shall not, under any circumstances, be construed as compensable delays.

4.8 Any extension of the Contract Time shall be by Change Order pursuant to Article 13.

4.9 The Contractor shall employ a competent project manager who shall represent the Contractor. Communications given to the project manager shall be binding as if given to the Contractor. The project manager will be employed full time on the Project and be located and assigned to the Project site during and for the duration of the Work.

4.10 The Contractor shall employ a competent Superintendent and necessary assistants who will be in attendance at the project site during the performance of the Work.

4.11 Upon execution of the Contract, materials may be purchased. No material escalation costs will be valid or compensable unless the Owner directs, in writing, a delay in the procurement.

ARTICLE 5
SUBMITTALS, PRODUCT DATA, SHOP DRAWINGS AND SAMPLES

5.1 Contractor shall review, approve, and submit to the Construction Administrator all Submittals including but not limited to, product data, Shop Drawings, and samples, with such promptness as to cause no delay in the Work.

5.2 Correction or approval of such Submittals, Shop Drawings, product data and samples will be made with reasonable promptness by the Architect or Engineer. Approval will be general only and shall not relieve the Contractor from responsibility for errors in dimensions, for construction and field coordination of the Work or for any departure from the Contract Documents, unless such departure has received the Owner's written approval.

5.3 No Work governed by such Shop Drawings, Schedules or samples shall be fabricated, delivered or installed until approved by the Architect or Engineer.

5.4 No damages for delays or time extensions will be granted, even if approvals deviate from the approved Schedule.

ARTICLE 6
SEPARATE CONTRACTS

6.1 The Owner reserves the right to perform Work in connection with the Contract with the Owner's own forces, or to let

separate contracts relating to the Contract (Project) site or in connection with Work on adjoining sites. In such cases, the Contractor shall afford such parties reasonable opportunity for storage of materials and equipment and coordinate and connect the Work with the work on adjoining sites or other Projects, and shall fully cooperate with such parties in the matter required under Article 7 herein.

6.2 Contractors working in the same vicinity shall cooperate with one another and, in case of dispute, decision of the Owner shall be final and binding to all Contractors involved, including Contractors under separate Contracts.

6.3 The Contractor shall assume all liability, financial or otherwise, in connection with this Contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience or delay which the Contractor may cause other Contractors. If the Contractor experiences a loss because of the presence and operations of other Contractors working adjacent to or within the limits of the same Project, then as between the Owner and the Contractor, the Contractor shall bear such loss.

6.4 Insofar as possible, the Contractor shall arrange the Work and shall place and dispose of the materials being used so as not to interfere with the operations of other Contractors adjacent to or within the limits of the same Project. The Contractor shall join its Work with that of others in an acceptable manner, and perform the Work in proper accordance with that of the others.

6.5 In no event shall the Owner be responsible for any claim or damages that are the result of the Contractor's failure to coordinate the Work with any other Contractor or Subcontractor.

ARTICLE 7
COOPERATION OF TRADES

7.1 The Contractor shall be responsible for and shall control all activities of their Subcontractors. The Subcontractors shall consult and cooperate with one another. Each Subcontractor shall furnish all necessary information to other Subcontractors and shall lay out and install their own Work so as to avoid any delays or interference with the Work of others.

7.2 Any cost or changes, cutting and/or repairing, made necessary by the failure to observe the above requirements shall be borne by the party or parties responsible for such failure or neglect or their faulty Work installed.

ARTICLE 8
DAMAGES

8.1 The Liquidated Damages, provided in the Bidding Documents, will be assessed at two distinct times, as follows:

8.1.1 Liquidated Damages – Substantial Completion:
If the Contractor fails to achieve Substantial Completion of the Work by the Substantial Completion Date, and such delay is not otherwise excused under this Contract, then the Contractor agrees to pay to the Owner Liquidated Damages for the dollar amount specified in the Bid Proposal Form for this Project, for each Day beyond Substantial Completion that the Contractor fails to achieve Substantial Completion. The parties to this Contract acknowledge and agree that the actual damages that are to be anticipated as a result of the neglect, failure, or refusal of the Contractor to substantially complete the Project by the established Substantial Completion Date are uncertain in amount or extremely difficult to determine. Accordingly, the parties to this Contract do intend and in fact now agree to liquidate damages in advance and stipulate that the amount set forth in this subparagraph is reasonable and an appropriate remedy and is intended to constitute compensatory damages and does not constitute a penalty of any kind. The parties understand and agree that, by including a provision for Liquidated Damages in this Contract, or in pursuing any relief pursuant to such provision:

.1 the parties do not intend to set a price for the privilege not to perform;

.2 the availability of Liquidated Damages may not be relied upon as a basis for argument that the Owner has an adequate remedy at law; and

3 the remedies available to the Owner under this Agreement are cumulative and not exclusive.

8.1.2 Liquidated Damages – Acceptance:
If the Contractor fails to complete all of the Work required for Acceptance of the Work within ninety (90) Days of Substantial Completion then the Contractor agrees to pay to the Owner Liquidated Damages for the dollar amount specified in the Bid Proposal Form for each Day in excess of ninety (90) Days beyond the Substantial Completion Date that the Contractor fails achieve Acceptance. The parties to this Contract acknowledge and agree that the actual damages that are to be anticipated as a result of the failure of the Contractor to complete all of the Work required for Acceptance within ninety (90) Days of the established Substantial Completion Date are uncertain in amount or extremely difficult to determine. Accordingly, the parties to this Contract do intend and in fact now agree to liquidate damages in advance and stipulate that the amount set forth in this subparagraph is reasonable and an appropriate remedy and is intended to constitute compensatory damages and does not constitute a penalty of any kind. The parties understand and agree that, by including a

provision for Liquidated Damages in this Contract, or in pursuing any relief pursuant to such provision:

.1 the parties do not intend to set a price for the privilege not to perform;

.2 the availability of Liquidated Damages may not be relied upon as a basis for argument that the Owner has an adequate remedy at law; and

.3 the remedies available to the Owner under this Agreement are cumulative and not exclusive.

8.2 The Liquidated Damages or any portion thereof may be waived at the sole discretion of the Commissioner.

8.3 No payment by the Owner, either partial or final, shall be construed to waive the Owner's right to seek Liquidated Damages.

8.4 In the event a court determines that the Contract herein is null and void for any reason, Contractor agrees that Contractor will not seek or pursue any lawsuit or claim for damages, including, but not limited to, claims for loss of Overhead or anticipated profits, against the Owner and the Owner shall not be liable for any damages which Contractor may incur as a result of such decision. In addition, if the court enjoins the Owner from entering into or proceeding with the Contract herein, the Owner shall not be liable for any damages arising out of or relating to the award of such Contract which Contractor may have incurred as a result of the injunction.

ARTICLE 9
MINIMUM WAGE RATES

9.1 In accordance with the provisions of the Connecticut General Statutes Section 31-53, the following applies:

"The wages paid on an hourly basis to any person performing the work of any mechanic, laborer, or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (h) of this section, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each payday."

9.2 Each Contractor who is awarded a Contract on or after October 1, 2002 shall be subject to provisions of the Connecticut General Statutes, Section 31-53 as amended by Public Act 02-69, "An Act Concerning Annual Adjustments to Prevailing Wages."

No wage adjustment will be made to the Contract for any wage increase under this Article.

ARTICLE 10
POSTING MINIMUM WAGE RATES

10.1 The Contractor shall post at conspicuous points on the site of the Contract a Schedule showing all determined wage rates for all trades and all authorized deductions, if any, from wages to be paid.

10.2 The Contractor shall provide weekly certified payrolls to the Owner for all persons working on the site.

ARTICLE 11
CONSTRUCTION SCHEDULES

11.1 Unless otherwise specified in the Contract Documents, within twenty-one (21) Days from the Contract Start Date, the Contractor shall submit the following to the Owner for approval:

11.1.1 A comprehensive Schedule of Submittals required by the Specifications. Said Schedule shall include Submittal dates, required approval dates and date material must be on site.

11.1.2 The Contractor shall allow a minimum of 14 Days for the Owner and its agents' review of Submittals. No extension of the Contract Time shall be granted for revisions and resubmission. Further, the Contractor shall allow a minimum of eight weeks for testing and Acceptance of the Work by the Owner.

11.1.3 When the Contract Documents specify a "CPM Schedule" a detailed Critical Path Method Schedule is required using software approved by the Owner and/or Construction Administrator with as many activities as necessary to make the Schedule an effective tool for planning and monitoring the progress of the Work. The Contractor shall show all pertinent activities requiring coordination between trades.

11.1.4 When the Contract Documents specify a "Construction Schedule" a detailed Construction Schedule is required using software approved by the Owner as a horizontal bar chart with a separate bar for each major portion of the Work or operation to make the Schedule an effective tool for planning and monitoring the progress of the Work.

11.2 Unless otherwise specified under the Contract Documents, the Contractor shall provide a monthly update of the CPM Schedule or Construction Schedule in the format required by the Owner as well as a disk of the updated Schedule and program. If, in the opinion of the Owner, the Work is falling behind Schedule, the Contractor shall submit a revised Schedule demonstrating a recovery plan to ensure Substantial Completion of the Work within the Contract Time.

11.3 Overtime, increased manpower, and additional shifts: If ordered by the Owner in writing, the Contractor shall work overtime, and/or add additional manpower and/or shifts:

11.3.1 If the Contractor is not behind Schedule, the Owner will pay the Contractor the actual additional premium portion of the wages for overtime or additional shift work not included in the Contract price, but the Contractor shall not be entitled to Overhead and Profit.

11.3.2 If the Contractor, through its sole or partial fault or neglect is behind Schedule, the Owner may order the Contractor, at the Contractor's expense, to increase its manpower or to work any overtime or additional shifts or take other action necessary to expedite the Work to meet the Project Schedule.

11.3.3 If the Schedule is shown to be more than 21 Days behind in any critical activity, overtime, increase manpower and/or additional shifts shall be implemented immediately regardless of who is at fault. A disagreement over the cause of the impact will not relieve the Contractor from the obligation of complying with this Article. Once liability for the impact is determined, compensation will be determined in accordance with 11.3.1 or 11.3.2.

11.3.4 The Owner reserves the right to suspend activity under Paragraph 11.3. Suspension shall be in writing and at the sole discretion of the Commissioner.

11.4 Requisitions for partial payment will not be processed until the Contractor has complied with this requirement.

ARTICLE 12
PREFERENCE IN EMPLOYMENT

12.1 Should this Contract be for the construction or repair of any building, then in the employment of labor to perform the Work specified herein, preference shall be given to citizens of the United States, who are, and continuously for at least three (3) months prior to the date hereof, have been residents of the labor market area, as established by the State of Connecticut Labor Commissioner, in which such Work is to be done, and if no such qualified person is available, then to citizens who have continuously resided in the county in which the Work is to be performed for at least three (3) months prior to the date hereof, and then to citizens of the state who have continuously resided in the State at least three months prior to the date hereof.

12.2 Should this Contract be for a Public Works Project other than for the construction, remodeling or repairing of public buildings covered by Connecticut General Statutes 31-52, then in the employment of mechanics, laborers or workmen to perform the Work specified herein, preference will be given to residents of the state who are, and continuously for at least six (6) months prior to the date hereof have been residents of this State, and if no such person is available then to residents of other states.

12.3 The provisions of this Article shall not apply where the state or any subdivision thereof may suffer the loss of revenue granted or to be granted from any Agency or Department of the federal government as a result of this Article or regulations related thereto.

ARTICLE 13
COMPENSATION FOR CHANGES IN THE WORK

13.1 At any time, without invalidating the Contract and by a written order and without notice to the sureties, the Owner, through the Construction Administrator, may order modifications in the Work consisting of additions, deletions or other revisions. Upon request, the Contractor shall supply the Construction Administrator promptly with a detailed proposal for the same, showing quantities of and Unit Prices for the Work and that of any Subcontractor involved.

13.2 Modifications to the Work will be authorized by a written Change Order, or if necessary to expedite the Work, a written Construction Change Directive, issued by the Owner as provided for in Article 25. Change Orders and Construction Change Directives shall be processed in accordance with the terms of the Contract Documents. Upon receipt of the written Change Order, the Contractor shall proceed with the Work when and as directed.

13.3 If a Change Order makes the Work less expensive for the Contractor, the proper deductions shall be made from the Contract Sum, said deductions to be computed in accordance with the provisions listed in this Article 13.

13.4 The Contractor shall not be entitled to an extension of time if in the opinion of the Owner the Additional Work in conjunction with the Work can be performed without impact on the Contract Time.

13.5 The Contractor may request, and the Owner may grant additional Contract Time when, in the opinion of the Owner,

the Contractor has demonstrated that the Additional Work cannot be performed in conjunction with the Work without impact on the original Substantial Completion and/or Acceptance (if applicable) date.

13.6 The amount of compensation to be paid to the Contractor for any Additional or Deleted Work that results in a Change Order shall be determined in one of the following manners:

13.6.1 AMOUNT OF COMPENSATION FOR CHANGE ORDER COSTS: LABOR, EQUIPMENT, BENEFITS AND MATERIAL:

13.6.1.1 Unit Price: As stated in the Contract Documents.

13.6.1.2 Unit Price: As subsequently agreed upon by the Contractor and Owner

13.6.1.3 Lump Sum: Agreed upon sum by the Owner and the Contractor. The Owner may rely on costs, prices, and documentation provided by the Contractor or Subcontractor in agreeing to a Lump Sum. If the Owner believes that additional information is necessary to substantiate the accuracy of the cost, the Owner reserves the right to request and receive additional information from the Contractor. The Lump Sum must be based upon the following itemized costs:

13.6.1.3.1 Labor: (Contractor's or Subcontractor's own forces) No Change Order Proposal shall be negotiated if the request is solely for the increased labor rate over those originally carried by the Contractor in its original bid. Additional foreman hours shall not be included unless additional crews are added and/or a compensable time extension is granted. Project Executive time shall not be included as a direct cost as it is part of the overhead mark-up allowed. Project manager hours shall not be included unless a compensable time extension is granted.

13.6.1.3.2 Material: (Actual cost to the Contractor or Subcontractor) Cost shall not be based upon list pricing unless it reflects the actual prices being paid and no discounts or other offsets are being received by the Contractor or Subcontractor. No Change Order Proposal shall be negotiated if the request is solely for the escalation of material prices over those originally carried by the Contractor in its original bid.

13.6.1.3.3 Benefits: (The established rates of the following benefit costs inherent to the particular labor involved):

13.6.1.3.3.1 Workers Compensation.

13.6.1.3.3.2 Federal Social Security.

13.6.1.3.3.3 Connecticut Unemployment Compensation.

13.6.1.3.3.4 Fringe Benefits.

13.6.1.4 Rented Equipment (Used directly on the Work and by the Contractor's or Subcontractor's own forces).

13.6.1.5 Owned Equipment (Used directly on the Work and by the Contractor's or Subcontractor's own forces). Daily rate is not to exceed 3% of the monthly rental rate as identified by a nationally recognized construction cost estimating guide or service.

13.6.1.6 SMALL TOOLS:

Include items such as shovels, picks, rakes, ladders, and power tools which are expected to be utilized on a project. Trade related equipment, hand tools, and power tools normally supplied with the labor or are normally expected to be owned in the performance of the typical work for a trade are not compensable. These costs shall not be approved as part of the Direct Cost of a Change Order as they are included in the Contractor's overhead mark-up percentage.

13.6.2 OVERHEAD AND PROFIT PERCENTAGES: (Maximum allowable percentages applied to labor, equipment, and material)

13.6.2.1 Contractor's mark-up for Work performed by its own forces:

Change Order Amount	Overhead and Profit
$0 to $ 5,000	20%
$5,001 to $15,000	17%
$15,001 to $25,000	15%
$25,000 and greater	12%

13.6.3 OVERHEAD AND PROFIT PERCENTAGES: (Maximum allowable percentages applied to labor, equipment, benefits and material)

13.6.3.1 Contractor's mark-up for Work performed by its Subcontractor's forces and not allowable for any subsidiary in which the Contractor has a majority ownership:

Change Order Amount	Overhead and Profit
$0 and greater	6%

13.6.4 OVERHEAD AND PROFIT PERCENTAGES: (Maximum allowable percentages applied to labor, equipment, benefits and material)

Subcontractor's mark-up for Work performed by its own forces:

Change Order Amount	Overhead and Profit
$0 to $ 5,000	20%
$5,001 to $15,000	17%
$15,001 to $25,000	15%
$25,000 and greater	12%

13.6.5 OVERHEAD AND PROFIT PERCENTAGES: (Maximum allowable percentages applied to labor, equipment, benefits and material)

13.6.5.1 Subcontractor's mark-up for Work performed by its Secondary Subcontractor's forces. Limited to one level (tier) below the Subcontractor and not allowable for any subsidiary in which the Subcontractor has a majority ownership.

Change Order Amount	Overhead and Profit
$0 and greater	6%

13.7 BOND COSTS

13.7.1 Actual additional bonding costs associated with the value of the Change Order will be compensable only when supported by written documentation by the bonding company that the Change Order requires an increase to the original Performance, Payment, Labor or Material Bond.

13.7.2 The Contractor shall notify the bonding company at each $500,000 increase to the contract value as the cumulative result of change orders. A copy of the Consent of Surety must be provided to the Owner prior to the execution of any change order which exceeds each cumulative $500,000.

13.8 Trade discounts, rebates, and amounts received from the sales by the Contractor of surplus materials and equipment shall accrue to the Owner.

13.9 If the parties cannot agree upon a Lump Sum, then the Commissioner, through the Project Manager, may at the option of the Commissioner take the following action(s):

13.9.1 Issue a Construction Change Directive for the Additional or Deleted Work. The amount of compensation shall be computed by the actual net costs to the Contractor determined by time and material or Unit Prices based upon the same information required in Subparagraphs 13.6.1.3.3.1 through 13.6.1.5:

13.9.1.1 Labor (Contractor's or Subcontractor's own forces)

13.9.1.2 Material (Used by Contractor's or Sub- contractor's own forces).

13.9.1.3 Benefits: (The established rates of the following benefit costs inherent to the particular labor involved):

13.9.1.3.1 Workers Compensation.

13.9.1.3.2 Federal Social Security.

13.9.1.3.3 Connecticut Unemployment Compensation.

13.9.1.3.4 Fringe Benefits.

13.9.1.4 Rented Equipment (Used directly on the Work and by the Contractor's or Subcontractor's own forces).

13.9.1.5 Owned Equipment (Used directly on the Work and by the Contractor's or Subcontractor's own forces). Daily rate is not to exceed 3% of the monthly rental rate that can be identified by a nationally recognized construction cost estimating guide or service.

13.9.2 Issue a Change Order adjusting the Contract Sum in the amount as determined by the Commissioner.

13.10 For any Change Order or Construction Change Directive the Contractor shall, when requested, promptly furnish in a form satisfactory to the Construction Administrator and the Owner a complete detailed accounting of all costs relating to the Additional Work, including but not limited to certified payrolls and copies of accounts, bills and vouchers to substantiate actual costs. Further, the Owner reserves the right to access and make copies of the Contractor's records at any time upon written request from the Commissioner.

13.11 Failure of the Contractor to negotiate in good faith issues of time and costs or failure to provide requested documentation within fourteen (14) Days, or a time period accepted by the Commissioner, shall constitute a waiver by the Contractor of any claim. In such cases the Owner may elect to issue a unilateral Change Order in an amount deemed to be fair and equitable by the Commissioner. The provisions hereof shall not affect the power of the Contractor to act in case of emergency, threatened injury to persons, or damage to Work on any adjoining property. In this case the Commissioner, through the Project Manager, shall issue a Change Order for such amount as the Commissioner finds to be reasonable cost of such Work.

ARTICLE 14
DELETED WORK

14.1 Without invalidating any of the terms of the Contract, the Commissioner may order deleted from the Contract any items or portions of the Work deemed necessary by the Commissioner.

14.2 The compensation to be deducted from the Contract Sum for such deletions shall be determined in the manner provided for under the provisions of Article 13 or in the event none of the provisions of Article 13 are applicable then by the value as estimated by the Owner.

ARTICLE 15
MATERIALS: STANDARDS

15.1 Unless otherwise specifically provided for in the Specifications, all equipment, materials and articles incorporated in

the Work are to be new and of the best grade of their respective kinds for the purposes. Wherever in the Contract Documents a particular brand, make of material, device, or equipment is shown or specified, the first manufacturer listed in the specification section is to be regarded as the standard. When the specification is proprietary and only one manufacturer is listed, the Contractor shall use the named manufacturer and no Substitutions or Equals will be allowed.

15.2 Any other brand, make of material, device, equipment, procedure, etc. which is a deviation from the specified requirement is prohibited from use, but may be considered by the Owner for approval as an Equal or Substitution. The Contractor is to adhere to the specific requirements of the Contract Documents. Substitutions are discouraged and are only approved by the Commissioner as an exception.

15.3 Submittals – Equals and Substitution Requests:

15.3.1 Substitution of Materials and Equipment before Bid Opening. The Owner will consider requests for Equals or Substitutions, if made prior to the receipt of the Bid. The information on all materials shall be consistent with the information herein.

15.3.1.1 Statement of Variances – a statement of variances must list all features of the proposed Substitution which differ from the Drawings, Specifications and/or product(s) specified and must further certify that the Substitution has no other variant features. A request will be denied if submitted without sufficient evidence.

15.3.1.2 Substitution Denial – any Substitution request not complying with the above requirements will be denied. Substitution request sent after the deadline established in the Notice to Bidder will be denied.

15.3.1.3 An addendum shall be issued to inform all prospective Bidders of any accepted Substitution in accordance with Owner's addenda procedures.

15.3.2 Substitution of Materials and Equipment After Bid Opening: Subject to the Architect or Engineer's determination, if the material or equipment is Equal to the one specified or pre-qualified and the DPW Project Manager's approval of such determination, Substitution of Material or Equipment may be allowed after the Letter of Award is issued only:

15.3.2.1 If the specified or pre-qualified item is delayed by unforeseeable contingencies beyond the control of the Contractor which would cause a delay in the Project completion;

15.3.2.2 If any specified or pre-qualified item is found to be unusable or unavailable due to a change by the manufacturer or other circumstances; or

15.3.2.3 If the Contractor desires to provide a more recently developed material, equipment, or manufactured model from the same named manufacturer than the one specified or pre-qualified; or

15.3.2.4 If the specified material and/or equipment inadvertently lists only a single manufacturer.

15.4 Contractor shall submit each request for Equal or Substitution to the Architect or Engineer who shall review each request and make the following recommendations to the Owner:

15.4.1 Acceptance or non-acceptance of the adequacy of the submission and required back-up,

15.4.2 Determination of the category of the request for Substitution or Equal, and

15.4.3 Overall recommendation for approval or rejection of the Substitution or Equal. The determination of the category as a Substitution may be grounds for an immediate rejection by the Owner.

15.5 Approval of the Owner for each Equal or Substitution shall be obtained before the Contractor proceeds with the Work. The decision of the Commissioner, in this regard, shall be final and binding on the Contractor.

15.6 No extension of time will be allowed for the time period required for consideration of any Substitution or Equal. No extension of time will be allowed and no responsibility will be assumed by the Owner when a Contractor submits a request for Substitution or Equal, whether such request be approved or denied, and the Contractor shall not be entitled to any claim for damages for delay.

15.7 If the Contractor submits any request for an Equal or a Substitution, he shall bear the burden of proof that such requested Equal or Substitution meets the requirements of the Plans and Specifications.

15.8 The Contractor shall purchase no materials or supplies for the Work which are subject to any chattel mortgage or which are under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that the Contractor has good title to all materials and supplies used by him in the Work.

15.9 All products and systems supplied to the State as a result of a purchase by a Contractor shall be certified that, to the best of the supplier's knowledge, there are no materials that are classified as hazardous materials being used within the assembly. Hazardous materials include, but are not limited to, products such as asbestos, lead, and other materials that have proven to cause a health risk by their presence.

ARTICLE 16
INSPECTION AND TESTS

16.1 The purpose of the inspections will be to assure that the Work is performed in accordance with the Contract Documents. These inspections shall include, but not be limited to, all inspections and testing as required by the Owner, and any authorities have jurisdiction.

16.2 All material and workmanship, if not otherwise designated by the Specifications, shall be subject to inspection, examination and test by the Commissioner at any and all times during manufacture and/or construction and at any and all places where such manufacture and/or construction is carried on. The Contract Documents additionally identify the parties responsible for performing and paying for the required testing and inspections. All required tests performed in a laboratory will be obtained and paid for by the Owner, except when the tests show the Work to be defective. The Contractor shall pay for all the costs associated with re-tests and re-inspections for all tests and inspections which fail. The Owner will issue a deduct Change Order to recover said retesting costs from the Contractor. All other tests, unless otherwise specified, shall be made at the Contractor's expense. Notice of the time of all tests to be made at the site shall be given to all interested parties, including the Owner.

16.3 Without additional cost to the Owner, the Contractor shall promptly furnish facilities, labor and materials necessary to coordinate and perform operational tests and checkout of the Work. The Contractor shall furnish promptly all reasonable facilities, labor, and materials necessary to make all such testing safe and convenient.

16.4 If, at any time before final payment and Acceptance of the Work, the Commissioner considers it necessary or advisable to examine of any portion of the Work already completed by removing or tearing out the same, the Contractor shall, upon request, furnish promptly all necessary facilities, labor, and materials. If such Work is found to be defective in any material respect, as determined by the Owner, because of a fault of the Contractor or any of the Contractor's Subcontractors, or if any Work shall have been covered without the approval or consent of the Commissioner (whether or not it is found to be defective), the Contractor shall be liable for testing costs and all costs of correction, including removal and/or demolition of the defective Work, including labor, material, and testing, including labor, material, re-testing or re-inspecting, services of required consultants, additional super-
vision, the Commissioner's and the Construction Administrator's administrative costs, and other costs for services of other consultants.

16.5 Cost of Systems Commissioning Retesting: The cost to retest a pre-functional or functional test, if the Contractor is responsible for the deficiency, shall be the Contractor's. If the Contractor is not responsible, any cost recovery for retesting costs shall be negotiated with the Contractor.

16.5.1 For a deficiency identified, not related to any pre-functional checklist or start-up fault, the following shall apply: The Systems Commissioning Authority (SCA) and Construction Administrator will direct the retesting of the equipment once at no "charge" to the Contractor for their time. However, the Systems Commissioning Authority's and Construction Administrator's time for additional testing will be charged to the Contractor.

16.5.2 The time for the Systems Commissioning Authority and Construction Administrator to direct any retesting required because a specific pre-functional checklist or start-up test item, reported to have been successfully completed, but determined during functional testing to be faulty, will be back charged to the Contractor.

16.5.3 Any required retesting by any Subcontractor shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.

ARTICLE 17
ROYALTIES AND PATENTS

17.1 If the Contractor desires to use any design, device, material or process covered by a patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the holder of said patent or copyright. The Contractor shall furnish a copy of this legal agreement to the Owner.

17.2 The Contractor shall indemnify and hold harmless the Owner and Construction Administrator for any costs, expenses and damage which it may be obliged to pay by reason of any infringement of a patent or a copyright, at any time during the prosecution or after the Final payment of the Work.

ARTICLE 18
SURVEYS, PERMITS AND REGULATIONS

18.1 Unless otherwise provided for, the Contractor shall furnish surveys necessary for the execution of the Work. The Owner will furnish the Contractor with two base lines and a benchmark.

18.2 The Contractor shall obtain and pay for permits and licenses necessary for the execution of the Work and the occupancy and use of the completed Work.

18.3 The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations including building and fire safety codes relating to the performance of the Work.

18.4 If underground utilities may be involved in part of the Work the Contractor is required to request "Call-Before-You-Dig" to verify the location of underground utilities at least (3) Working Days, as further defined under Paragraph 1.71 herein, prior to the start of any excavation. The Contractor shall also notify the Owner and Agency at least (3) Working Days prior to the start of any excavation. If "Call-Before-You-Dig" fails or refuses to respond to the Contractor's request, then the Contractor shall obtain the services of a qualified underground utility locating firm, at no additional cost to the Owner, to verify locations of underground utilities prior to the start of any excavation. The Contractor shall be held responsible for providing safety, protecting the Work and protecting workmen as necessary to perform the Work. The Contractor shall be responsible for maintaining and protecting all original utility mark-out at no additional cost to the Owner.

ARTICLE 19
PROTECTION OF THE WORK, PERSONS AND PROPERTY

19.1 The Contractor shall continuously and adequately protect the Work against damage from any cause, and shall protect materials and supplies furnished by the Contractor or Subcontractors, whether or not incorporated in the Work, and shall make good any damage unless it be due directly to errors in the Contract Documents or is caused by agents or employees of the Owner.

19.2 To the extent required by law, by public authority, or made necessary in order to safeguard the health and welfare of the personnel or occupants of any of the state institutions, the Contractor shall adequately protect adjacent property and persons, and provide and maintain all facilities, including but not limited, to passageways, guard fences, lights, and barricades necessary for such protection.

19.3 The Contractor shall take all necessary precautions for the safety of employees on the Work and shall comply with applicable provisions of federal and state safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. The Contractor shall also comply with the applicable provisions of the Associated General Contractors' "Manual of Accident Prevention in Construction", the standards of the Connecticut Labor Department and Occupational Safety and Hazard Association (OSHA).

19.4 The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for the protection of employees of the State and the public, and shall post danger signs warning against any dangerous condition or hazard created by such things as protruding nails, well holes, elevator hatchways, scaffolding, window openings, excavations, tripping hazards or slipping, stairways and falling materials.

19.5 The Contractor shall designate a qualified and responsible on-site staff person, whose duty shall be the prevention of accidents. The name and position of the designated person shall be reported to the Owner by the Contractor at the commencement of the Contract.

19.6 The Contractor shall at all times protect excavations, trenches, buildings, and all items of Work from damage by rain, water from melted snow or ice, surface water run off and subsurface water usual for the vicinity at the time of operations; and provide all pumps and equipment and enclosures to insure such protection.

19.7 The Contractor shall construct and maintain all necessary temporary drainage and provide all pumping necessary to keep excavation, basements, footings and foundations free of water.

19.8 The Contractor shall remove all snow and ice as may be required for access to the site and proper protection and prosecution of the Work.

19.9 The Contractor shall install bracing, shoring, sheathing, sheet piling, caissons and any other underground facilities as required for safety and proper execution of the Work, and shall remove this portion of the Work when no longer necessary.

19.10 During cold weather the Contractor shall protect all Work from damage. If low temperature makes it impossible to continue operations safely in spite of cold weather precautions, the Contractor may cease Work upon the written approval of the Commissioner.

ARTICLE 20
TEMPORARY UTILITIES

20.1 Unless expressly provided for otherwise in the Contract Documents, the Contractor shall include in the proposed contract bid price as stated on the Bid Proposal Form, the costs of all temporary utilities required for Project completion and protection of the Work. Said temporary utilities include, but are not limited to, lighting, heating, cooling, electrical power, water, telephone, sanitary facilities, and potable water.

ARTICLE 21
CORRECTION OF WORK

21.1 The Contractor shall promptly and without expense to the Owner remove from the premises all materials rejected by or unacceptable to the Commissioner as failing to conform to the Contract Documents, whether incorporated in the Work or not.

21.2 The Contractor shall promptly and without expense to the Owner replace any such materials, which do not conform to the Contract Documents, and shall bear the expense of making good all Work of other Contractors or Subcontractors destroyed or damaged by such removal or replacement.

21.3 If the Contractor, after receipt of notice from the Owner, shall fail to remove such rejected or unacceptable materials within a reasonable time as fixed in said notice, the Owner may remove and store such materials at the expense of the Contractor.

21.4 Such action shall not affect the obligation of the Contractor to replace and complete assembly and installation of the Work and to bear the expenses referred to above. Prior to the correction of rejected or unacceptable Work or if the Commissioner deems it inexpedient or undesirable to correct any portion of the Work which was rejected, deemed unacceptable, or not done in accordance with the Contract Documents, the Contract Sum shall be reduced by such amount as, in the judgment of the Commissioner, shall be equitable.

21.5 No extension of time will be given to the Contractor for correction of rejected or unacceptable Work. All significant punchlist Work shall be completed before Substantial Completion is determined. The remaining minor punchlist Work, as determined by the Commissioner, shall be completed within ninety (90) Days of established Substantial Completion date.

21.6 Final Payment shall not relieve the Contractor of responsibility for the defects in material or workmanship.

21.7 Unless expressly provided for otherwise in the Contract Documents, the Contractor shall remedy any rejected or unacceptable Work, and any Work found to be not conforming to the Contract Documents which is discovered within 18 Months after the date of Substantial Completion. The Contractor shall pay for any damage to other Work caused by such nonconforming Work or any damage created in correcting the nonconforming Work.

ARTICLE 22
GUARANTEES and WARRANTIES

22.1 Unless expressly provided for otherwise in the Contract Documents, the Contractor shall provide a Warranty on the Work for an 18-Month period from the date of Substantial Completion. The Contractor shall warrant that the equipment, materials and workmanship are of good quality and new, unless permitted elsewhere by the Contract Documents, and that the Work shall be free from defects not inherent in the quality required or permitted and that the Work conforms to the Contract Documents.

22.2 Disclaimers and limitations from manufactures, Subcontractors, suppliers or installers to the Contractor shall not relieve the Contractor of the Warranty on the Work. The Contract Documents detail the related damages, reinstatement of Warranty, replacement cost and Owner's recourse.

ARTICLE 23
CUTTING, FITTING, PATCHING, AND DIGGING

23.1 The Contractor will perform or will cause the Subcontractors to perform all cutting, fitting, or patching of the portion(s) of the Work that may be required to make the several parts thereof joined and coordinated in a manner satisfactory to the Commissioner and in accordance with the Plans and Specifications.

23.2 The responsibility for defective or ill-timed Work shall be with the Contractor, but such responsibility shall not in any way relieve the Subcontractor who performed such Work. Except with the consent of the Commissioner, neither the Contractor nor any of its Subcontractors shall cut or alter the Work of any other Contractor or Subcontractor.

ARTICLE 24
CLEANING UP

24.1 The Contractor shall, on a daily basis, keep the premises free from accumulations of waste material or rubbish.

24.2 Prior to Acceptance of the Work, the Contractor shall remove from and about the site of the Work, all rubbish, all temporary structures, tools, scaffolding, and surplus materials, supplies, and equipment which may have been used in the performance of the Work. If the Commissioner in his sole discretion determines that the Contractor has failed to clean

the work site, the Owner may remove the rubbish and charge the cost of such removal to the Contractor. A deduct Change Order will be issued by the Owner to recover such cost.

ARTICLE 25
ALL WORK SUBJECT TO CONTROL OF THE COMMISSIONER

25.1 The Commissioner hereby declares that the DPW Project Manager is the Commissioner's only authorized repre-

sentative to act in matters involving the Owner's, and/or Architect's or Engineer's, ability to revoke, alter, enlarge or relax any requirement of the Contract Documents; to settle disputes between the Contractor and the Construction Administrator; and act on behalf of the Commissioner. In all such matters, the provisions of Articles 13 and 14 herein shall guide the DPW Project Manager.

25.2 In no event may the Contractor act on any instruction of the Agency without written consent of the Owner. In the event the Contractor acts without such consent, he does so at his own risk and at his own expense, not only for the Work performed, but for the removal of such Work as determined necessary by the Commissioner.

25.3 In the performance of the Work, The Contractor shall abide by all orders, directions, and requirements of the Commissioner at such time and places and by such methods and in such manner and sequence as the Commissioner may require.

25.4 The Commissioner shall determine the amount, quality, acceptability and fitness of all parts of the Work, shall interpret the plans, Specifications, Contract Documents and extra work orders and shall decide all other questions in connection with the Work.

25.5 The Contractor shall employ no plant, equipment, materials, methods, or persons to which the Commissioner objects and shall remove no plant materials, equipment, or other facilities from the site of the Work without the permission of the Commissioner. Upon request, the Commissioner shall confirm in writing any oral order, direction, requirement or determination.

25.6 In accordance with Section 4b-24 of the Connecticut General Statutes, the public auditors of the State of Connecticut and the auditors or accountants of the Commissioner of Public Works shall have the right to audit and make copies *of* the books of any Contractor employed by the Commissioner.

ARTICLE 26
AUTHORITY OF THE CONSTRUCTION ADMINISTRATOR

26.1 The Construction Administrator employed by the Commissioner is authorized to inspect all Work for conformance to the Contract Documents. The Construction Administrator is authorized to reject all Work found to be defective, unacceptable and nonconforming to the Contract Documents. Such inspections and rejections may extend to all or any part of the Work, and to the preparation or manufacture of the material to be used.

26.2 The Construction Administrator is not empowered to revoke, alter, enlarge, or relax any requirements of the Contract Documents, or to issue instructions contrary to the Contract Documents. The Construction Administrator shall in no case act as foreman or perform other duties for the Contractor, nor shall the Construction Administrator interfere with the management of the Work by the Contractor. Any advice, which the Construction Administrator may give the Contractor, shall in no way be construed as binding the Commissioner or Owner in any way, nor releasing the Contractor from the fulfillment of the terms of the Contract.

26.3 In any dispute arising between the Contractor and the Construction Administrator with reference to inspection and rejection of the Work, the Construction Administrator may suspend Work on the non-compliant portion of the Work until the dispute can be referred to and decided by the Commissioner.

ARTICLE 27
SCHEDULE OF VALUES, APPLICATION FOR PAYMENT

27.1 Immediately after the signing of the Contract, the Contractor shall furnish for the use of the Commissioner, as a basis for estimating partial payments, a certified Schedule of Values, totaling the Contract Sum and broken down into quantities and unit costs, as outlined in the Contract Documents and as directed by the Owner. The Schedule of Values must reflect true costs and be in sufficient detail to be an effective tool for monitoring the progress of the Work Upon request of the Commissioner; the Contractor shall supply copies of signed Contracts, vendor quotations, etc. as back up to the Schedule of Values.

27.2 Approval of the Schedule of Values by the Commissioner is required prior to any payment by the Owner.

27.3 The Schedule of Values shall include a breakdown of the Contractor's general condition costs.

27.3.1 Non-recurring costs, (i.e. Mobilization costs, utility hook-ups, temporary heat) will be paid at the time of occurrence.

27.3.2 Reoccurring costs will be paid in proportion to the percent of completion of the Project.

27.3.3 Further detail can be found in the General Requirements 01.29.76; paragraphs 1.3.B.4 for this project.

27.4 The Schedule of Values shall include a breakdown of Contract closeout costs including systems certification testing and acceptance, training, Warranties, Guarantees, As-Built Drawings and attic stock**.**

27.5 The Contractor shall make periodic applications for payment, which shall be subdivided into categories corresponding with the approved Schedule of Values and shall be in such numbers of copies as may be designated by the Commissioner.

ARTICLE 28
PARTIAL PAYMENTS

28.1 Commissioner will examine the Contractor's Applications For Payments to determine, in the opinion of the Commissioner, the amounts that properly represent the value of the Work completed and the materials suitably stored on the site.

28.2 In making such Application For Payment for the Work, there shall be deducted seven and one-half percent (7.5%) of the amount of each Application for Payment to be retained by the Owner as Retainage until Final Completion.

28.2.1 The Commissioner has the sole discretion in the determination of reduction in Retainage. At fifty percent (50%) completion of the Work the Owner shall issue a "Contractor's Performance Evaluation". If the Contractor receives a performance evaluation score of "Good" or better, then the Retainage withheld may be reduced to five percent (5%). All subsequent Applications for Payment shall be subject to five percent (5%) Retainage. Upon Substantial Completion, the Retainage may be reduced at the request of the Contractor and recommendation of the DPW Project Manager. In the event of a reduction in Retainage to below five percent (5%), the minimum Retainage withheld shall not be less than the DPW Project Manager's estimate of the remaining Work or two and one-half percent (2.5%), which ever is greater. All requests for Retainage Reduction shall be done on DPW Form 748F_Retainage Reduction Request, which can be found at the end of the General Conditions.

28.2.2 Subsequent to Substantial Completion, in limited circumstances, at the sole discretion of the Commissioner, a reduction of Retainage below Two and one-half percent (2.5%) may be considered.

28.2.3 A "Good" Contractor's Performance Evaluation score shall be defined as a minimum total score of sixty percent (60%).

28.3 The decision of the Commissioner to reduce the Retainage rate will be based upon the Contractor's Performance Evaluation score for completed portions of the Work as set out above and other factors that the Commissioner may find appropriate as follows:

28.3.1 The Contractor's timely submission of an appropriate and complete CPM Schedule or Construction Schedule and Schedule of Values, in compliance with the Contract requirements and the prompt resolution of the Owner's and/or Architect's or Engineer's comments on the submitted material resulting in an appropriate basis for progress of the Work.

28.3.2 The Contractor's timely and proper submission of all Contract Document required submissions: including, but not limited to, Shop Drawings, material certificates and material samples and the prompt resolution of the Owners and/or Architect's or Engineer's comments on the submitted material, resulting in an appropriate progress of the Work.

28.3.3 The Contractor's provision of proper and adequate supervision and home office support of the Project.

28.3.4 The Work completed to date has been installed or finished in a manner acceptable to the Owner.

28.3.5 The progress of the Work is consistent with the approved CPM Schedule or Construction Schedule.

28.3.6 All approved credit change orders have been invoiced.

28.3.7 All Change Order requests for pricing are current.

28.3.8 The Contractor has and is maintaining a clean worksite in accordance with the Contract Documents.

28.3.9 All Subcontractor payments are current at the time of reduction request.

28.3.10 Contractor is compliant with set-aside provisions of the contract.

28.4 No payments will be made for improperly stored or protected materials or unacceptable Work.

28.5 At his or her sole discretion, the Commissioner may allow to be included in the monthly requisitions payment requests for materials and equipment stored off the site.

28.5.1 In the event the Commissioner allows the Contractor to include in its requisitions payment requests for materials and equipment stored off the site, the Contractor shall also submit any additional bonds and/or insurance certificates relating to off-site stored materials and equipment, and follow such other procedures as may be required by the State to obtain the Commissioner's approval of such requests.

28.5.2 The Architect or Engineer, or Construction Administrator shall have inspected said materials and equipment and recommended payment therefore. The Contractor shall pay for the cost of the Architect's or Engineer's, or Construction Administrator's time and expense in performing these inspection services.

ARTICLE 29
DELIVERY OF STATEMENT SHOWING AMOUNTS DUE FOR WAGES, MATERIALS, AND SUPPLIES

29.1 For each Application for Payment under this Contract, the Owner reserves the right to require the Contractor and every Subcontractor to submit a written verified statement, in a form satisfactory to the Owner, showing in detail all amounts then due and unpaid by such Contractor or Subcontractor for daily or weekly wages to all laborers employed by it for the performance of the Work or to other persons for materials, equipment or supplies delivered at the site.

29.2 The term "laborers" as used herein shall include workmen, workwomen, and mechanics.

29.3 Failure to comply with this requirement may result in the Owner withholding the Application for Payment pursuant to Article 28.

ARTICLE 30
SUBSTANTIAL COMPLETION AND ACCEPTANCE

30.1 Substantial Completion:

30.1.1 When the Contractor considers that the Work or a portion thereof is Substantially Complete, the Contractor shall request an inspection of said Work in writing to the Construction Administrator. The request shall certify that the Contractor has completed its own inspection prior to the request and that the Contractor is compliant with all requirements of Section 01 77 00 of the General Requirements. The request must also include a statement that a principal or senior executive of the Contractor is ready, willing and able to attend a walk through inspection with the Architect or Engineer.

30.1.2 Upon receipt of the request, the Architect or Engineer, Construction Administrator and Owner, will make an inspection to determine if the Work or designated portion thereof is Substantially Complete. A principal or senior executive of the Contractor shall accompany the Architect or Engineer during each inspection/re-inspection. If the inspection discloses any item, whether or not included on the inspection list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item.

30.1.3 The Contractor shall then submit a request for another inspection. The determination of Substantial Completion is solely within the discretion of the Owner. Any costs for re-inspection beyond one, shall be at the expense of the Contractor and such costs will be recovered by issuance of a credit Change Order. When the Work or designated portion thereof is determined to be Substantially Complete, the Contractor will be provided a Certificate of Substantial Completion from the Owner. The Certificate of Substantial Completion shall establish the date when the responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, are transferred to the Owner and shall fix the time within which the Contractor shall finish all items on the inspection list accompanying the Certificate. If the punch list is not complete in 90 Days, the Owner reserves the right to complete the outstanding punch list items with their own forces or by awarding separate contracts and to deduct the cost thereof from the amounts remaining due to the Contractor.

30.1.4 The Certificate of Substantial Completion shall be signed by the Construction Administrator, Owner, and Architect or Engineer. Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Construction Administrator and Architect or Engineer, the Owner shall make payment reflecting adjustment in Retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

30.2 Acceptance:

30.2.1 Upon completion of the Work, the Contractor shall forward to the Construction Administrator a written notice that the Work is ready for inspection and Acceptance.-

30.2.2 When the Work has been completed in accordance with terms and conditions of the Contract Document as determined by the Owner a Certificate of Acceptance shall be issued by the Owner.

ARTICLE 31
FINAL PAYMENT

31.1 The Owner reserves the right to retain for a period of thirty (30) Days after filing of the Certificate of Acceptance the amount therein stated less all prior payments and advances whatsoever to or for the account of the Contractor.

31.2 All prior estimates and payments, including those relating to extra or additional Work, shall be subject to correction by the Final Payment.

31.3 No Application for Payment, Final or Partial, shall act as a release to the Contractor or the Contractor's sureties from any obligations under this Contract.

31.4 The Architect or Engineer and Construction Administrator will promptly issue the Certificate for Payment, stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in said Final Payment is due and payable.

31.5 Final Payment shall not be released until a Certificate of Acceptance and a Certificate of Compliance have been issued.

31.6 Neither Final Payment nor any Retainage shall become due until the Contractor submits to the Owner the following:

31.6.1 An affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied.

31.6.2 A certificate evidencing that insurance required by the Contract Documents to remain in force after Final Payment is currently in effect and will not be canceled or allowed to expire without at least 30 Days prior written notice to the Owner.

31.6.3 A written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents.

31.6.4 Written consent of surety, if any, to Final Payment.

31.6.5 If required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorney's fees.

ARTICLE 32
OWNER'S RIGHT TO WITHHOLD PAYMENTS

32.1 The Commissioner may withhold a portion of any Payment due the Contractor that may, in the judgment of the Commissioner, be necessary:

32.1.1 To assure the payment of just claims then due and unpaid to any persons supplying labor or materials for the Work.

32.1.2 To protect Owner from loss due to defective, unacceptable or non-conforming Work not remedied by the Contractor.

32.1 To protect the Owner from loss due to injury to persons or damage to the Work or property of other Contractors, Subcontractors, or others caused by the act or neglect of the Contractor or any of its Subcontractors.

32.2 The Owner shall have the right to apply any amount withheld under this Article as the Owner may deem proper to satisfy protection from claims. The amount withheld shall be considered a payment to the Contractor.

32.3 The Owner has the right to withhold payment if the Contractor fails to provide accurate submissions of Submittals, up date the status including but not limited to the following: As-Built Drawings, request for information (RFI) log, Schedule, submittal log, Change Order log, certified payrolls and daily reports and all other requirement of the Contract Documents.

32.4 If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorney's fees.

ARTICLE 33
OWNER'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

33.1 The Commissioner shall have the authority to suspend the Work wholly or in part, for such period or periods as the Commissioner considers being in the best interests of the State, or in the interests of public necessity, convenience or safety. During such periods the Contractor shall store all materials and equipment, in such a manner to prevent the materials and equipment from being damaged in any way, and the Contractor shall take precautions to protect the Work from damage.

33.1.1 If the Commissioner, in writing, orders the performance of all or any portion of the Work to be suspended or delayed for an unreasonable period of time (i.e. not originally anticipated, customary, or inherent in the construction industry) and the Contractor believes that additional compensation and/or Contract Time is due as a result of such suspension or delay, the Contractor shall submit to the Commissioner in writing a request for a Contract adjustment within 7 Days of receipt of the notice to resume Work. The request shall set forth the specific reasons and support for said adjustment.

33.1.2 The Commissioner shall evaluate any such requests received. If the Commissioner agrees that the cost and/or time required for the performance of the Contract has increased as a result of such suspension and that the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or Subcontractors, and was not caused by weather, then the Commissioner will make a reasonable adjustment, excluding profit, of the Contract terms. The Commissioner will notify the Contractor of the determination as to what adjustments of

the Contract, if any, that the Commissioner deems warranted.

33.1.3 No Contract adjustment will be made unless the Contractor has submitted the request for adjustment within the time prescribed.

33.1.4 No Contract adjustment will be made under this Article to the extent that performance would have been suspended or delayed by any other cause within the Contractor's control or by any factor for which the Contractor is responsible under the Contract; or that such an adjustment is provided for or excluded under other term or condition of this Contract.

33.2 Notwithstanding any provision or language in the Contract to the contrary, the State may terminate the Contract whenever the Commissioner determines at his sole discretion that such termination is in the best interests of the State. Any such termination shall be effected by delivery to the Contractor of a written Notice of Termination specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination shall be effective.

33.2.1 In the event of such termination, the Contractor shall be entitled to reasonable compensation as determined by the Commissioner, however, no claim for lost Overhead or profits shall be allowed.

33.2.2 All Work and materials obtained by the Contractor for the Work, that have been incorporated into the Work, inspected, tested as required, accepted by the Commissioner, and paid for by the State, shall become the property of the State.

33.2.3 Materials obtained by the Contractor for the Work that have been inspected, tested as required, and accepted by the Commissioner, and that are not incorporated into the Work, shall, at the option of the Commissioner, be purchased from the Contractor at actual cost as shown by receipted bills. To this cost shall be added all actual costs for delivery at such points of delivery as may be designated by the Commissioner, as shown by actual cost records.

33.2.4 Termination of the Contract shall not relieve the Contractor or its Surety of their responsibilities for the completed Work, nor shall it relieve the Contractor's Surety of its obligations to ensure completion of the Work and to pay legitimate claims arising out of Work.

ARTICLE 34
SUBLETTING OR ASSIGNING OF CONTRACT

34.1 The Contract or any portion thereof, or the Work provided for therein, or the right, title, or interest of the Contractor therein may not be sublet, sold, transferred, assigned, or otherwise disposed of to any person, firm, or corporation without the written consent of the Commissioner.

34.2 No person, firm, or corporation other than the Contractor to whom the Contract was awarded shall be permitted to commence Work at the site of the Contract until such consent has been granted.

ARTICLE 35
CONTRACTOR'S INSURANCE

35.1 The Contractor shall not start Work under the Contract until they have obtained insurance as stated in SECTIONS 00 62 16 CERTIFICATE OF INSURANCE and 00 40 13 BID PROPOSAL FORM, subsections 4.4.2 and 4.4.3, of the Project Manual and until the insurance has been approved by the Owner. The Contractor shall not allow any Subcontractor to start Work until the same insurance has been obtained by the Subcontractor and approved by the Owner or the Contractor's insurance provides coverage on behalf of the Subcontractor. The Contractor shall send Certificates of Liability Insurance to the Bidding and Contracts Unit, Department of Public Works, 165 Capitol Avenue, Room G-35, Hartford, CT 06106 unless otherwise directed in writing. Presented below is a narrative summary of the insurance required.

35.1.1 Commercial General Liability Insurance including contractual liability, products/completed operations, broad form property damage and independent Contractors. The limits shall be no less than $1,000,000 each occurrence and $2,000,000 annual aggregate. Coverage for hazards of explosion, collapse and underground (X-C-U) and for asbestos abatement when applicable to this Contract, must also be included when applicable to the Work to be performed. The State of Connecticut, the Department of Public Works, and their respective officers, agents, and employees shall be named as an Additional Insured. This coverage shall be provided on a primary basis.

35.1.2 Owner's and Contractor's Protective Liability insurance providing a total limit of $1,000,000 for all damages arising out of bodily injury or death of persons in any one accident or occurrence and for all damages arising out of injury or destruction of property in any one accident or occurrence and subject to a total (aggregate) limit of $2,000,000 for all damages arising out of bodily injury to or death of persons in all accidents or occurrences and out of injury to or destruction of property during the policy period. This coverage shall be for and in the name of the State of Connecticut.

35.1.3 Automobile Liability The operation of all motor vehicles including those owned, non-owned and hired or used in connection with the Contract shall be covered by Automobile Liability insurance providing for a total limit of $1,000,000 for all damages arising out of bodily injuries to or death of all persons in any one accident or occurrence

and for all damages arising out of injury to or destruction of property in any one accident or occurrence. In cases where an insurance policy shows an aggregate limit as part of the automobile liability coverage, the aggregate limit must be at least $2,000,000. This coverage shall be provided on a primary basis. Should the Contractor not own any automobiles, the automobile & liability requirement shall be amended to allow the Contractor to maintain only hired and non-owned liability coverage.

35.1.4 Excess Liability (Other than Umbrella Form) insurance in the amount of $5,000,000 for bids of $1,000,000 - $10,000,000 and in the amount of $10,000,000 for bids of $10,000,001 - $20,000,000. Refer to Section 00 92 00 Amendments of the Project Manual for Excess Liability insurance requirements for bids exceeding $20,000,000.

35.1.5 Workers' Compensation and Employer's Liability as required by Connecticut Law and **Employers' Liability** with a limit of not less than $100,000 per occurrence, $500,000 disease policy limit and $100,000 disease each employee. When Work is on or contiguous to navigable bodies of waterways and ways adjoining, the Contractor shall include the Federal Act endorsement for the U.S. Longshoremen's and Harbor Workers Act.

35.1.6 Special Hazards Insurance, if required, will be stated in SECTION 00 40 13 BID PROPOSAL FORM, subsection 4.4.2 of this Project Manual. This includes coverage for explosion, collapse or underground damage and for asbestos abatement when applicable to this Contract and shall be no less than $1,000,000 each occurrence.

35.1.7 Builder's Risk Insurance, if required, will be stated in Section 00 40 13 Bid Proposal Form, subsection 4.4.3 of this Project Manual.

35.1.8 Inland Marine/Transit Insurance: With respect to property with values in excess of $100,000 which is rigged, hauled or situated at the site pending installation, the Contractor shall maintain inland marine/transit insurance provided the coverage is not afforded by a Builder's Risk policy.

35.1.9 When required to be maintained, the Builder's Risk and/or Inland Marine/Transit Insurance policy shall endorse the State of Connecticut as a Loss Payee and the policy shall state it is for the benefit of and payable to the State of Connecticut.

35.2 Satisfying Limits Under an Umbrella Policy: If necessary, the Contractor may satisfy the minimum limits required above for either Commercial General Liability, Automobile Liability, and Employer's Liability coverage under an Umbrella or Excess Liability policy. The underlying limits may be set at the minimum amounts required by the Umbrella or Excess Liability policy provided the combined limits meet at least the minimum limit for each required policy. The Umbrella or Excess Liability policy shall have an Annual Aggregate at a limit not less than two (2) times the highest per occurrence minimum limit required above for any of the required coverages. The State of Connecticut shall be specifically endorsed as an Additional Insured on the Umbrella or Excess Liability policy, unless the Umbrella or Excess Liability policy provides continuous coverage to the underlying policies on a complete "Follow-Form" basis.

35.3 The Contractor shall, at its sole expense, maintain in full force and effect at all times during the life of the Contract or the performance of Work hereunder, insurance coverage as described herein. Certificates shall include a minimum thirty (30)-day endeavor to notify requirement to the Owner prior to any cancellation or non-renewal.

35.4 The Contractor shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, coinsurance penalty, or self-insured retention, including any loss not covered because of the operation of such deductible, coinsurance penalty, or self-insured retention.

35.5 The requirement contained herein as to types and limits of insurance coverage to be maintained by the Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor.

35.6 Hold Harmless Provisions: The Contractor shall at all times indemnify and save harmless the State of Connecticut, the Department of Public Works, and their respective officers, agents, and employees, on account of any and all claims, damages, losses, litigation, expenses, counsel fees and compensation arising out of injuries (including death) sustained by or alleged to have been sustained by the officers, agents, and employees of said State or Department, or of the Contractor, his Subcontractor, or materialmen and from injuries (including death) sustained by or alleged to have been sustained by the public, any or all persons on or near the Work, or by any other person or property, real or personal (including property of said State or Department) caused in whole or in part by the acts, omissions, or neglect or the Contractor including, but not limited to, any neglect in safeguarding the Work or through the use of unacceptable materials in constructing the Work of the Contractor, any Subcontractor, materialman, or anyone directly employed by them or any of them while engaged in the performance of the Contract, including the entire elapsed time from the date of the Notice to Proceed or the actual Commencement Of The Work whichever occurs first until its completion as certified by the Department of Public Works.

ARTICLE 36
FOREIGN MATERIALS

36.1 Preference shall be given to articles or materials manufactured or produced in the United States, Canada, and Mexico, (the members of the North American Free Trade Agreement (NAFTA)); and the products shall meet all of the referenced standards and Specifications for conditions of performance, quality, and price with duty being equal.

36.2 Only articles or materials manufactured or produced in the United States, Canada, and Mexico, (the members of the North American Free Trade Agreement (NAFTA)), will be allowed. The foregoing provisions shall not apply to foreign articles or materials required by the Contract Documents.

ARTICLE 37
HOURS OF WORK

37.1 No person shall be employed to work or be permitted to work more than eight (8) hours in any Day or more than forty (40) hours in any week for any Work provided in the Contract, in accordance with Connecticut General Statute Section 31-57.

37.2 The operation of such limitation of hours of work may be suspended during an emergency, upon the approval of the Commissioner, in accordance with Connecticut General Statute Section 31-57.

ARTICLE 38
CLAIMS

38.1 General: When filing a formal claim under Section 4-61 (referred to as "Section 4-61" below) of the Connecticut General Statutes (as revised), either as a lawsuit in the Superior Court or as a demand for arbitration, the Contractor must follow the procedures and comply with the requirements set forth in this Article. This Section does not, unless so specified, govern informal claims for additional compensation which the Contractor may bring before the Department. The Contractor should understand, however, that the Department may need, before the Department can resolve such a claim, the same kinds of documentation and other substantiation that it requires under this Article. It is the intent of the Department to compensate the Contractor for actual increased costs caused by or arising from acts or omissions on the part of the Department that violate legal or contractual duties owed to the Contractor by the Department.

38.2 Notice of Claim: Whenever the Contractor intends to file a formal claim against the Department under Section 4-61, seeking compensation for additional costs, the Contractor shall notify the Commissioner in writing (in strict compliance with Section 4-61) of the details of said claim. Such written notice shall contain all pertinent information described in Paragraph 38.5 below.

Once formal notice of a claim under Section 4-61(b) (as revised) has been given to the Commissioner, the claimant may not change the claim in any way, in either concept or monetary amount, (1) without filing a new notice of claim and demand for arbitration to reflect any such change, and (2) without the minimum period of six months after filing of the new demand commencing again and running before any hearing on the merits of the claim may be held. The only exception to this limitation will be for damages that continue to accrue after submission of the notice, in ways described and anticipated in the notice.

38.3 Record Keeping: The Contractor shall keep daily records of all costs incurred in connection with its Work on behalf of the Department. The daily records shall identify each aspect of the Project affected by matters related to any claim for additional compensation that the Contractor has filed, intends to file, or has reason to believe that it may file against the Department; the specific Project locations where Project work has been so affected; the number of people working on the affected aspects of the Project at the pertinent time(s); and the types and number of pieces of equipment on the Project site at the pertinent time(s). Any potential or anticipated effect on the Project's progress or Schedule which may result in a claim by the Contractor shall be noted contemporaneously with the cause of the effect, or as soon thereafter as possible.

38.4 Claim Compensation: The payment of any claim, or any portion thereof, that is deemed valid by the Department shall be made in accordance with the following provisions of this Article:

38.4.1 Compensable Items: The liability of the Department for claims will be limited to the following specifically identified items of cost, insofar as they have not otherwise been paid for by the Department, and insofar as they were caused solely by the actions or omissions of the Department or its agents (except that with regard to payment for extra work, the Department will pay to the Contractor the Overhead and profit percentages provided for in Article 13.):

38.4.1.1 Additional Project-site labor expenses.

38.4.1.2 Additional costs for materials.

38.4.1.3 Additional, unabsorbed Project-site Overhead (**e.g.**, for mobilization and demobilization).

38.4.1.4 Additional costs for active equipment.

38.4.1.5 For each Day of Project delay or suspension caused solely by actions or omissions of the Department either:

38.4.1.5.1 an additional ten percent (10%) of the total amount of the costs identified in Subparagraphs 38.4.1.1 through 38.4.1.4 above; except that if the delay or suspension period prevented the Contractor from incurring enough Project costs under Subparagraphs 38.4.1.1 through 38.4.1.4 during that period to require a payment by the Department that would be greater than the payment described in Subparagraph 38.4.1.5.2 below, then the payment for affected home office Overhead and profit shall instead be made in the following *per diem* amount :

38.4.1.5.2 six percent (6%) of the original total Contract amount divided by the original number of Days of Contract Time. Payment under either 38.4.1.5.1 or 38.4.1.5.2 hereof shall be deemed to be complete and mutually satisfactory compensation for any unabsorbed home office overhead and any profit related to the period of delay or suspension.

38.4.1.6 Additional equipment costs. Only actual equipment costs shall be used in the calculation of any compensation to be made in response to claims for additional Project compensation. Actual equipment costs shall be based upon records kept in the normal course of business and in accordance with generally- accepted accounting principles. Under no circumstances shall Blue Book or other guide or rental rates be used for this purpose (unless the Contractor had to rent the equipment from an unrelated party, in which case the actual rental charges paid by the Contractor, so long as they are reasonable, shall be used). Idle equipment, for instance, shall be paid for based only on its actual cost to the Contractor.

38.4.1.7 Subcontractor costs limited to, and determined in accordance with, Subparagraphs 38.4.1.1 through 38.4.1.5 above and applicable statutory and case law. Such Subcontractor costs may be paid for by the Department only: (a) in the context of an informal claims settlement; or (b) if the Contractor has itself paid or legally assumed, present unconditional liability for those Subcontractor costs.

38.4.2 Excusable But Not Compensable Items: The Contractor may be allowed Days but the Department will have no liability for the following non-compensable items:

38.4.2.1 Abnormal or unusually severe weather
38.4.2.2 Acts of God
38.4.2.3 Force Majeure
38.4.2.4 Concurrent Delay

38.4.3 Non-Compensable Items: The Department will have no liability for the following specifically-identified non-compensable items:

38.4.3.1 Profit, in excess of that provided for herein.
38.4.3.2 Loss of anticipated profit.
38.4.3.3 Loss of bidding opportunities.
38.4.3.4 Reduction of bidding capacity.
38.4.3.5 Home office overhead in excess of that provided for in Subparagraph 38.4.1.5 hereof.
38.4.3.6 Attorneys fees, claims preparation expenses, or other costs of claims proceedings or resolution.
38.4.3.7 Subcontractor failure to perform
38.4.3.8 Any other consequential or indirect expenses or costs, such as tort damages, or any other form of expense or damages not provided for in these specifications or elsewhere in the Contract.

38.5 Required Claim Documentation: All claims shall be submitted in writing to the Commissioner, and shall be sufficient in detail to enable the Department to ascertain the basis and the amount of each claim, and to investigate and evaluate each claim in detail. As a minimum, the Contractor must provide the following information for each and every claim and sub-claim asserted:

38.5.1A detailed factual statement of the claim, with all dates, locations and items of Work pertinent to the claim.

38.5.2 A statement of whether each requested additional amount of compensation or extension of time is based on provisions of the Contract or on an alleged breach of the Contract. Each supporting or breached Contract provision and a statement of the reasons why each such provision supports the claim must be specifically identified or explained.

38.5.3 Excerpts from manuals or other texts which are standard in the industry, if available, that support the Contractor's claim.

38.5.4 The details of the circumstances that gave rise to the claim.

38.5.5 The date(s) on which any and all events resulting in the claim occurred, and the date(s) on which conditions resulting in the claim first became evident to the Contractor.

38.5.6 Specific identification of any pertinent document, and detailed description of the substance of any material oral communication, relating to the substance of such claim.

38.5.7 If an extension of time is sought, the specific dates and number of Days for which it is sought, and the basis or bases for the extension sought. A critical path method, bar chart, or other type of graphical schedule that supports the extension must be submitted.

38.5.8 When submitting any claim over $50,000, the Contractor shall certify in writing, under oath and in accordance with the formalities required by the contract, as to the following:

38.5.8.1 That supporting data is accurate and complete to the Contractor's best knowledge and belief;

38.5.8.2 That the amount of the dispute and the dispute itself accurately reflects what the Contractor in good faith believes to be the Department's liability;

38.5.8.3 The certification shall be executed by:

38.5.8.3.1 If the Contractor is an individual, the certification shall be executed by that individual.

38.5.8.3.2 If the Contractor is not an individual, the certification shall be executed by a senior company official in charge at the Contractor's plant or location involved or an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

38.6 Auditing of Claims: All claims filed against the Department shall be subject to audit by the Department or its agents at any time following the filing of such claim. The Contractor and its Subcontractors and suppliers shall cooperate fully with the Department's auditors. Failure of the Contractor**,** its Subcontractors, or its suppliers to maintain and retain sufficient records to allow the Department or its agents to fully evaluate the claim shall constitute a waiver of any portion of such claim that cannot be verified by specific, adequate, contemporaneous records, and shall bar recovery on any claim or any portion of a claim for which such verification is not produced. Without limiting the foregoing requirements, and as a minimum, the Contractor shall make available to the Department and its agents the following documents in connection with any claim that the Contractor submits:

38.6.1 Daily time sheets and foreman's daily reports.
38.6.2 Union agreements, if any.
38.6.3 Insurance, welfare, and benefits records.
38.6.4 Payroll register.
38.6.5 Earnings records.
38.6.6 Payroll tax returns.
38.6.7 Records of property tax payments.
38.6.8 Material invoices, purchase orders, and all material and supply acquisition contracts.
38.6.9 Materials cost distribution worksheets.
38.6.10 Equipment records (list of company equipment, rates, etc.).
38.6.11 Vendor rental agreements.
38.6.12 Subcontractor invoices to the Contractor, and the Contractor's certificates of payments to Subcontractors.
38.6.13 Subcontractor payment certificates.
38.6.14 Canceled checks (payroll and vendors).
38.6.15 Job cost reports.
38.6.16 Job payroll ledger.
38.6.17 General ledger, general journal (if used), and all subsidiary ledgers and journals**,** together with all supporting documentation pertinent to entries made in these ledgers and journals.
38.6.18 Cash disbursements journals.
38.6.19 Financial statements for all years reflecting the operations on the Project.
38.6.20 Income tax returns for all years reflecting the operations on the Project.
38.6.21 Depreciation records on all company equipment**,** whether such records are maintained by the company involved, its accountant, or others.
38.6.22 If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
38.6.23 All documents which reflect the Contractor's actual profit and overhead during the years that the Project was being performed**,** and for each of the five years prior to the commencement of the Project.
38.6.24 All documents related to the preparation of the Contractor's bid**,** including the final calculations on which the total proposed Contract bid price as stated in the Bid Proposal Form was based.
38.6.25 All documents which relate to the claim or to any sub-claim, together with all documents that support the amount of damages as to each claim or sub-claim.

38.6.26 Worksheets used to prepare the claim, which indicate the cost components of each item of the claim, including but not limited to the pertinent costs of labor, benefits and insurance, materials, equipment, and Subcontractors' damages, as well as all documents which establish the relevant time periods, individuals involved, and the Project hours and the rates for the individuals.
38.6.27 The name, function, and pertinent activity of each Contractor's or Subcontractor's official, or employee, in volved in or knowledgeable about events that give rise to, or facts that relate to, the claim.
38.6.28 The amount(s) of additional compensation sought and a break-down of the amount(s) into the categories specified as payable under Paragraph 38.4 above.
38.6.29 The name, function, and pertinent activity of each Department official, employee, or agent involved in or

knowledgeable about events that give rise to, or facts that relate to, the claim.

ARTICLE 39
DIESEL VEHICLE EMISSIONS CONTROL

39.1 The Contractor shall be responsible for compliance with the following provisions:

39.1.1 All Contractor and Subcontractor diesel powered non-road construction equipment with engine horsepower (HP) ratings of 60 HP and above, that are on the Project or are assigned to the Contract for a period in excess of 30 consecutive Days, shall be retrofitted with emission control devices in order to reduce diesel emissions. In addition, all motor vehicles and/or construction equipment (both on-highway and non-road) shall comply with all pertinent State and Federal regulations relative to exhaust emission controls and safety.

39.1.2 Retrofit emission control devices shall consist of oxidation catalysts, or similar retrofit equipment control technology that is:

39.1.2.1 Included on the U.S. Environmental Protection Agency (EPA) "Verified Technology List," as may be amended from time to time http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm and

39.1.2.2 Verified by EPA to provide a minimum emissions reduction of 20% particulate matter (PM_{10}), 40% carbon monoxide (CO), and 50% hydrocarbons (HC).

39.1.3 Construction shall not proceed until all diesel powered non- road construction equipment meeting the criteria in provision 39.1.1 have been retrofitted, unless the Commissioner grants a waiver under provision 39.2.

39.1.4 The Contractor shall at least monthly, assess which diesel powered non-road construction equipment are subject to these provisions. The Contractor shall notify the DPW Project Manager of any violations of these provisions.

39.1.5 Idling of delivery and/or dump trucks, or other diesel powered equipment shall be limited to three (3) minutes during non-active use in accordance with the Regulations of Connecticut State Agencies Section 22a-74-18(b)(3)(C), which states, in part:

"[N]o person shall cause or allow a Mobile Source to operate for more than three (3) consecutive minutes when such Mobile Source is not in motion, except as follows:

When a Mobile Source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control,

When it is necessary to operate defrosting, heating or cooling equipment to ensure the safety or health of the driver or passengers,

When it is necessary to operate auxiliary equipment that is located in or on the Mobile Source to accomplish the intended use of the Mobile Source,(To bring the Mobile Source to the manufacturer's recommended)

When a Mobile Source is in queue to be inspected by U.S. military personnel prior to gaining access to a U.S. military installation."

39.1.6 All Work shall be conducted to ensure that no harmful effects are caused to adjacent Sensitive Receptor Sites. Diesel powered engines shall be located away from fresh air intakes, air conditioners, and windows.

39.1.7 If any diesel powered non-road construction equipment is found to be in non-compliance with these provisions by the DPW Project Manager, the Contractor will be issued a Non-Conformance Notice and given a 24 hour period in which to bring the equipment into compliance or remove it from the Project. The Contractor's failure to comply with these provisions shall be reason to withhold payment as described in Article 33.

39.1.8 Any costs associated with these provisions shall be included in the general cost of the contract. In addition, there shall be no time granted to the Contractor for compliance with these provisions. The Contractor's compliance with these provisions and any associated regulations shall not be grounds for a Change Order.

39.2 The Commissioner reserves the right to waive all or portions of these provisions at his/her discretion. The Contractor may request a waiver to all or portions of these provisions with written justification to the Commissioner as to why the Contractor cannot comply with these provisions. A waiver, to be effective, must be granted in writing by the Commissioner.

END

State of Connecticut

Retainage Reduction Request

Department of Public Works

To: David O'Hearn, P.E., Deputy Commissioner
Room 473B, 165 Capitol Avenue, Hartford, CT 06106

From: ( ), General Contractor

Subject: Project No. ( )
Reduction of Retainage at ( )% project completion

In accordance with the General Conditions, Article 28, (type general contractor's name) hereby requests a reduction of retainage to an amount of XX %. The following list of items required under the general conditions is in compliance with the terms of the contract and has been verified by the Contractor.

- ❒ Performance Evaluation is a minimum of 60%
- ❒ Timely submission of an appropriate and complete CPM Schedule or Construction Schedule and Schedule of Values, in compliance with the Contract requirements and the prompt resolution of the Owner's and/or A-E's comments on the submitted material resulting in an appropriate basis for progress of the Work.
- ❒ Timely and proper submission of all Contract Document required submissions: including but not limited to Shop Drawings, material certificates and material samples and the prompt resolution of the Owner's and/or Architect's or Engineer's comments on the submitted material resulting in an appropriate progress of the Work.
- ❒ Proper and adequate supervision and home office support of the Project.
- ❒ The Work completed to date has been installed or finished in a manner acceptable to the Owner.
- ❒ The progress of the Work is consistent with the approved CPM Schedule or Construction Schedule.
- ❒ All approved credit Change Orders have been invoiced.
- ❒ All Change Order requests for pricing are current.
- ❒ The Contractor has and is maintaining a clean worksite in accordance with the Contract Documents.
- ❒ All Subcontractor payments are current at the time of reduction request.
- ❒ Contractor is compliant with set-aside provisions of the contract.

Contractor Certification

name	signature	date

Project Manager Recommendation

name	signature	date

Approved

Deputy Commissioner David O'Hearn — signature — date

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SUPPLEMENTARY GENERAL CONDITIONS

1. SCOPE AND LOCATION OF WORK

a. The work in connection with the subject project involves the located on the Midtown Campus of Western Connecticut State University, Danbury, Connecticut.

b. This contract will include all new items unless otherwise approved.

c. Please refer to Section 01100 Summary of Work.

d. The referencing project name and no. are as follows:

Project Name: New Restroom Facilities, Westside Campus
Ref. No.: DAS Project No. BI-RD 306 /Bid #2020-MRC-0002

e. It is the intention of the project to end up with a complete, finished, code compliant, safe university facility.

2. UNIVERSITY REPRESENTATIVE

a. The University Representative/Construction Administrator is Daniel L. Casinelli, AIA, LEED AP, Western Connecticut State University, 181 White Street, Danbury, CT 06810, telephone: 203-837-8680.

3. EXAMINATION OF SITE

a. It is not the intent of the drawings to show all existing conditions. All bidders are required to visit and examine the site prior to submitting bids. Failure to visit the site and note all conditions will in no way relieve the Contractor of his responsibility for completing the work called for in the contract documents.

4. INTENT OF DOCUMENTS

a. The specifications are intended to describe all material and labor necessary to determine the intention of the subject project and assumes the inclusion of all miscellaneous and incidental items necessary to complete the work.

b. These specifications are divided into titled divisions and sections under the divisions. The divisions and sections do not, however, operate to make the University Representative an arbiter to establish the limits to the contract between the Contractor and his Subcontractors.

c. In the event of a conflict within the contract documents…the more stringent requirements will apply.

5. USE OF PREMISES. SPECIAL WORKING CONDITIONS

a. The Contractor shall confine the construction to the following time period:

Monday through Friday, 7:30 a.m. to 4:30 p.m.

b. Parking for Contractor's employees will be limited to an area designated by the University. The Contractor shall be provided identification stickers for employees' cars.

c. The contract shall be responsible for keeping the premises clean and shall pick up rubbish and debris daily.

6. MAINTENANCE OF TRAFFIC WAYS

a. The Contractor shall be granted the use of paved roads and parking areas but shall not infringe in use of same, or access thereto, for passage over the Owner's property. Traffic ways shall not be blocked by standing trucks, parked cars, material storage, construction operations, or in any other manner.

b. Public roads, and the existing paved roads and parking areas on Owner's property, shall be kept free from scrap and other material due to construction operations, and any damage to their surface caused by the Contractor shall be repaired by him at his own expense to the satisfaction of the University Representative.

7. PLANS AND SPECIFICATIONS AT THE SITE

The contractor shall maintain at the site of the work, one copy of all specifications, addenda, approved shop drawings, change orders, and other modifications, schedules and instructions, in good order and marked to record all changes made during construction. These shall be available at all times to the agency representative.

8. SHOP DRAWINGS

a. Shop drawings shall be submitted in sufficient number of copies and manner to facilitate the work and shall show all work in detail.

b. The Contractor shall review the shop drawings, stamped with his approval and submit them with reasonable promptness and in orderly sequence so as to cause no delay in his work or in the work of any sub-contractor. Shop drawings shall be properly identified as specified, for item, material, workmanship (when required) and project. At the submission, the Contractor shall inform the Architect, in writing, of any deviation in the shop drawing from the requirements of the Contract Documents.

9. SAMPLES

a. Submit samples of all items where specifically required. Furnish information and data describing items or materials offered as being equal to those specified, as may be necessary to establish such quality. The Owner's decision will be final.

b. Mark samples clearly to show:

(1) Name of trade, type quality or grade and any further designation necessary to identify the items or material

(2) Manufacturer's or producer's name

(3) Name of Contractor of Subcontractor, if any

(4) Name and number of project

c. Submit samples of such size and/or number sufficient to show quality, type, range of color, finish and texture.

d. Materials furnished shall be equal to approved samples.

10. CONSTRUCTION EQUIPMENT

a. The contractor shall furnish and maintain, at his own cost and risk, all tools, apparatus and appliances necessary to insure speed, convenience and safety in the execution of his contract. All such items shall comply with OSHA REGULATIONS AND ALL APPLICABLE CODES, STATUTES, RULES AND REGULATIONS.

b. All staging, supports, bracing and similar work, exterior and interior, shall be furnished erected and removed by this Contractor and maintained in safe condition by him without charge to and for the use of all trades as needed by them for proper execution of their work, except where specified to the contrary in the contract documents.

c. All hoisting equipment and machinery required for the property and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by this Contractor for the use of all subcontractors' materials and/or equipment delivered to the designated hoisting area except that which is specifically required in each appropriately related section of the specifications. All costs for hoisting operating services shall be borne by this Contractor, unless specifically excepted elsewhere.

11. RECORD DRAWINGS DURING CONSTRUCTION

a. The Contractor is to maintain at the project site two (2) sets of black (or blue) and white prints of the Contract Drawings on which he must record changes as they occur on the job.

b. At the conclusion of construction, he is to turn one (1)-corrected set over to the Agency.

12. PROTECTION

a. Safety: The contractor shall review, follow and adhere to the policies and procedures defined in the Western Connecticut State University "Safety Requirements for Contractors" document available through the Environmental and Facilities Services Department at the University at 203-837-9309. Any of the forms that need to completed, due to the type of work being performed, pertaining to the work described in the document shall be submitted to the University Representative, Environmental and Facilities Services Department and Architect/Engineer prior to the start and any project.

b. Fire protection: The contractor shall, during the progress of construction, assume all responsibilities for loss or damage by fire to the work included in his contract until completion of the contract. All fire used within structure for working purposes shall be extinguished when not in use. No flammable material shall be stored in the structure in excess of the amounts allowed by the authorities. No gasoline shall be stored in the structure outside of working hours.

c. Protection from theft or vandalism: The Contractor shall be solely responsible for damage, loss or liability due to theft or vandalism.

d. All building equipment, furnishings, grounds, planting, etc. shall be protected from damage of every description and any such damage thereto shall be repaired or otherwise made good at no expense to the University.

e. Supply and install any and all protective coverings and barricades necessary to prevent damage or personal injury. The Contractor shall be held responsible for, and must make good, at his own expense, any water damage or any other type of damage due to improper protective coverings.

f. Protect at all times the public and building personnel from injury due to construction activities

13. TEMPORARY OFFICES

Temporary offices will not be provided by the University for this project.

14. TEMPORARY TELEPHONES

Public telephones are not available on the Campus grounds.

15. TEMPORARY TOILET SERVICE

The University will permit the Contractor to use a specified existing toilet facility within the building. It shall be required of the Contractor to maintain and keep the toilet reasonably clean, or the privilege may be terminated in which case he must provide portable, chemical toilet facilities.

16. TEMPORARY LIGHT AND POWER

Power for construction purposes will be provided by the University. The Contractor will provide all necessary equipment, electrical cables, etc. that he may need in the use of the electric power.

17. DELIVERY, STORAGE AND HANDLING

All materials and equipment shall be so delivered, stored and handled as to prevent intrusion of foreign matter and any damage by weather or breakage. Packaged materials shall be delivered and stored in original packages. Packages, materials and equipment showing evidence of damage shall be rejected and replaced at no additional cost to owner. The contractor will make his own accommodations for deliveries and not use WCSU Receiving Department for deliveries.

18. CODE AND SPECIFICATIONS

All references to standard specifications and codes made throughout the specifications refer to the latest edition in effect at the dates of proposal. Such references include current addenda and errata, if any, and shall be considered a part of these specifications as much as if the pertinent portion of those standard specifications were printed herein in their entirety.

19. ADDENDA ISSUED DURING BIDDING PERIOD

When returning a bid, the Contractor will note receipt of any addenda received

20. DIMENSIONS AND MEASUREMENTS

The Contractor and each subcontractor shall **verify** all dimensions before ordering any material or doing any work, and shall be responsible for connection of same. Any difference that may be found shall be submitted for clarification before submitting a bid and for construction.

21. FINAL CLEANING

The Contractor, preparatory to final inspection, shall provide final cleaning of all work in readiness for use.

22. SPECIAL REQUIREMENT, GUARANTEES AND WARRANTIES

The contractor shall guarantee all materials and workmanship for a period of eighteen (18) months, from the date of substantial completion. In addition, the Contractor shall provide special guarantees where indicated in the contract documents or where a manufacturer's guarantee exceeds eighteen (18) months.

23. FORMS, BONDS, GUARANTEES AND WARRANTIES

The Contractor shall furnish to the Agency Representative the foregoing documents in the following manner:

a. Addressed to:

Luigi Marcone
Chief Facilities Officer & Assoc. V.P. for Campus Planning
Western Connecticut State University
181 White Street; Danbury, CT 06810

b. Project Title and Number:

c. I (We) hereby guarantee (warranty) the _____work on the referenced project for a period of _____years from_____ against failure of workmanship and materials, etc., in accordance with the requirements of Division _____, Section _____, Page ___, Paragraph _____, of the contract specifications.

Signed _____
Contractor
(By Authorized Agent)

d. All required bonds shall be by the respective Surety Companies, made out to Western Connecticut State University.

e. All guarantees supplied by Subcontractors, suppliers of manufacturers shall be countersigned by Contractor.

24. <u>OPENINGS, CHASES, INSERTS, ETC.</u>

a. These may not be shown on the working drawings, and it shall be the responsibility of the Contractor to examine the electrical, heating, plumbing and ventilating drawings and consult with the contractors for same, and to provide all such chases, channels, openings definitely located by such trades previous to the construction by him of the work involved.

b. The Contractor, his subcontractors and others shall furnish properly located and install sleeves, inserts, hangers, etc., required for the installation of their work.

c. After the installation and completion of the work for which openings, channels, chases, etc., have been provided, the Contractor shall properly close and finish all openings, channels, chases, etc. as required to complete the work.

25. <u>OCCUPANCY PRIOR TO FINAL INSPECTION</u>

a. Upon completion, and before final inspection, together with the status of completion and terms of occupancy will be issued by the University.

b. The University will obtain from the General Contractor written approval of such occupancy and will determine whether such occupancy or use is possible and, if so, will make arrangements for holding a job inspection with the Contractor.

c. A punch list based on this inspection, together with the status of completion and terms of occupancy will be issued by the University.

The letter granting such occupancy will state the terms and conditions of occupancy and that fire insurance coverage has been requested, the effective date of which will indicate to the Contractor that he may cancel the fire insurance coverage normally carried o the building by him.

26. <u>OPERATING AND MAINTENANCE INSTRUCTIONS</u>

a. Upon completion, and before final acceptance, the Contractor in coordination with the Architect, shall provide information concerning al mechanical equipment, alarm

and safety equipment and shall furnish three (3) separately bound sets of operating and maintenance instructions, properly labeled for said equipment. These shall be typewritten or mimeographed, 8-1/2 x 11 inch sheets describing the equipment and detailing the sequencing and settings. Complete data on lubrication, service repair, and parts listed shall be included in these instructions. Manufacturers' bulletins or catalogs will be acceptable for the above purpose, but shall be amplified as required to provide full instructions. Installed model, size, rating, operating and other applicable information shall be clearly identified.

Manufacturers' specific operating and servicing manuals are acceptable, provided they fully cover the requirements and any additional data is appended. Complete writing and control diagrams are required to explain the operating; services and repair are to be included, and their location in the building given. Valve identification shall include the assigned tab numbers in the valve directory. All copies shall be submitted by the University.

b. In addition, the Contractor shall furnish and install enclosed in clear plastic with eyelet for fastening, one (1) set of operating instructions, with necessary diagrams, which shall be hung adjacent to the item of equipment or at the operating stations to which the instructions apply.

c. Upon completion of all work and tests, the Contractor shall furnish the necessary skilled labor to fully instruct the University personnel in the location, operation and maintenance of the equipment.

END OF SECTION

PART 1 – GENERAL

1.1 DEFINITIONS:

A. Contractor:
Whenever the term **"Contractor"** is used in these Division 01 General Requirements and the Contract Documents, it may be understood to mean either the **Design-Bid-Build (D-B-B) "General Contractor"** or the **Construction Manager at Risk ("CMR")** as applicable to the specific Project.

B. Contract:
Whenever the term **"Contract"** is used in these Division 01 General Requirements and the Contract Documents, it may be understood to mean either the **D-B-B General Contractor's Contract Sum** as stated in their Contract or the **CMR's Contract Sum** as stated in their CMR Agreement, as applicable to the specific Project.

1.2 RELATED DOCUMENTS:

A. The Contract Documents are defined in the D-B-B and CMR Division 00 General Conditions, as applicable to the specific Project.

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

1.3 WORK COVERED BY CONTRACT DOCUMENTS:

A. Project Delivery Method:

1. **X** Design-Bid-Build (DBB);

2. ☐ Construction Manager at Risk (CMR)

B. Project Number: BI-RD-306

C. Project Title: WCSU Westside Campus – New Restroom Facility

D. Project Location: Westside Campus, located on Sand Road, Danbury, Connecticut.

E. The Project Description:

1. Construction of a new building of approximately 1,200 gross square feet, to provide restroom facilities in support of existing athletic fields on the WCSU Westside Campus.

2. The building shall be constructed of materials that include but are not limited to the following: The structure shall consist of load-bearing concrete masonry exterior cavity wall construction, supporting wood-framed roof construction, with prefinished steel panel standing seam roof covering. Foundations and floor slab shall consist of cast-in-place reinforced concrete. Interior finishes include paint and glazed CMU. Floor coverings include sealed concrete and resin epoxy finish. Ceilings shall be painted gypsum board.

3. The Authorities Having Jurisdiction for Threshold Projects, Non-Threshold Projects, and/or Connecticut State University System (CSUS) 2020 Projects, as defined by the Connecticut General Statutes, are the Connecticut Department of Administrative Services (DAS) / Construction Services (CS) Office of State Building Inspector (OSBI) and Office of State Fire Marshal (OSFM).

F. Owner:

1. **Owner's Name:** The Owner is Western Connecticut State University (WCSU).

2. **Authorized Representative for the Owner: Project Manager Name:** Eric Lessne.

a. **Project Manager's Location:** The Project Manager is located at WCSU Whitehall Planning & Engineering, 181 White Street, Danbury, CT.

b. **Phone:** 860-982-8364.

c. **Email(s): ELessne@commnet.edu**

3. **Authority:** The WCSU Project Manager is the only authorized representative for the Department of Administrative Services Commissioner to act in matters involving revoking, altering, enlarging or relaxing any requirement of the Contract Documents.

a. **Related Section: Article 25, All Work Subject To Control of the Commissioner**, Division 00 General Conditions of the Contract for Construction.

G. **Agency:**

1. **Agency Name:** The Connecticut State (User) Agency is Connecticut State Colleges and Universities (CSCU).

2. **Agency Representative Name and Title:** Eric J. Lessne, The Agency Representative's Title is Associate Director for Project Management and Engineering.

a. **Agency Representative Location**: The Agency Representative is located at WCSU Whitehall Planning & Engineering, 181 White Street, Danbury, CT.

b. **Phone**: 860-982-8364

c. **Email(**s): ELessne@commnet.edu

3. **Authority:** The Agency Representative has the administrative authority for the facility and or site where the work is being performed but does not have the authority to change the Contract Documents or direct the Contractor.

H. **Architect and Engineer (A/E):**

1. **Architect's Name:** The Architect representing the firm for this project is Clohessy Harris & Kaiser, LLC.

a. **Architect's Location:** The Architect is located at **573 Hopmeadow Street, PO Box 95, Simsbury, CT 06070.**

b. **Phone:** 860-651-3777

c. **Fax:** 860-651-7316

d. **Email(s): hughs@chkarch.com**

2. The Architect and Engineer (A/E) or their accredited representative is referred to in the Contract Documents as "Architect" or "Architects" or "Engineer" or "Engineers" or by pronouns which imply them. As information for the Contractor, the Architect's or Engineer's status is defined as follows:

a. The Architect and Engineer will not make interpretations or decisions directly to the Contractor. All interpretations or decisions will be conveyed through the Construction Administrator to the WCSU Project Manager.

b. As the authorized representative of the Department of Administrative Services Commissioner, the Architect and Engineer is responsible for review of shop drawings, materials, and equipment intended for the work, in accordance with the Division 00 "General Conditions" and "Supplementary Conditions".

3. Wherever the Architect or Engineer is mentioned in the documents in connection with an administrative function, it shall include the Construction Administrator in that function except for shop drawings.

I. **Work:** The Work Includes but is not limited to the following:

1 Site Construction, Landscaping, Site Utilities;

2 Cast-in-Place Concrete;

3 Structural Steel, Miscellaneous Metals;

4 Rough Carpentry, Finish Carpentry;

5 Waterproofing, Roofing, Sheet metal, and Joint Sealants;

6 Doors and Frames, Overhead Doors, Aluminum Windows, Hardware;

7 Drywall and Painting;

8 Fire Extinguishers;

9 Plumbing, HVAC, and Controls;

10 Electrical and Fire Alarm Systems; and

11 Special Equipment.

J. The Contractor will include in their bid, all items required in order to carry out the intent of the Work as described, shown and implied in the Contract Documents.

K. It shall be the Contractor's responsibility upon discovery to immediately notify the Construction Administrator, in writing, of errors, omissions, discrepancies, and instances of noncompliance with applicable codes and regulations within the documents, and of any work which will not fit or properly function if installed as indicated on the Contract Documents. Any additional costs arising from the Contractor's failure to provide such notification shall be borne by the Contractor.

L. The Work will be constructed under the Contractor's Contract as applicable to this Project.

1.4 CONTRACTOR'S USE OF PREMISES:

A. **General:** During the construction period the Contractor shall have full use of the newly constructed premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform work or to retain other contractors on portions of the Project.

B. **Use of the Site:** Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. **Owner Occupancy:** Allow for Owner occupancy and use by the public of the existing facility.

2. The Contractor shall confine his operations including storage of materials, supplies, equipment, and apparatus to the areas bounded by the contract limits indicated and as directed in the Contract Documents.

3. Existing roads, drives, walks, and parking areas which are not within the contract limit line are to be kept free and clear at all times. All deliveries for the project are to enter the Pending property from Pending .The Contractor shall check all Pending roadways for accessibility and clearances for deliveries of all large material and equipment. The Contractor shall inform the Construction Administrator at least seventy-two (72) hours in advance of these deliveries so they can be coordinated with the Agency so appropriate traffic control, etc. can be provided. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

4. The Contractor shall be responsible for keeping the premises clean and shall pick up rubbish and debris and promptly remove from site.

5. Parking for the Contractor's employees will be limited to an area designated by the Construction Administrator, and the Contractor may be required to provide identification stickers for all employees' cars.

6. Special precautions shall be taken to protect all wetland areas designated to remain. Prevent any and all sediment, debris, or other materials from getting into these areas. Should any sediment, debris, or other materials get into these areas or if any damage occurs to the vegetation therein, the Contractor shall immediately contact the Construction Administrator for direction.

7. The Contractor shall comply with local working hour restrictions, unless specifically approved otherwise in writing by the Owner.

8. No signs, other than those approved by the Construction Administrator, will be visible on the premises.

1.5 OCCUPANCY REQUIREMENTS:

A. **Full Agency Occupancy During Construction:** The Owner reserves the right to allow the Agency to occupy the site and existing building during the entire construction period. Cooperate with the Agency during construction operations to minimize conflicts and facilitate Agency usage. Perform the Work so as not to interfere with the Agency's operations.

1. Provide adequate building and fire code egress from the buildings during the renovation process and/or as indicated on the Contract Documents. The Contractor will be responsible to maintain and protect egress ways during the construction sequence as required and/or indicated in the Contract documents. The Contractor shall be responsible for preparing egress plans for Owner approval and for DAS/CS Office of State Building Official and Office of State Fire Marshal for approval if required.

B. **Agency Occupancy:**

1. The Construction Administrator will determine whether such occupancy is possible and, if so, will make arrangements for holding a job inspection with the WCSU Project Manager, Agency Representative, and Contractor.

2. A comprehensive list of items to be completed or corrected as issued by the Contractor, together with the status of completion and terms of occupancy, will be forwarded to the WCSU Project Manager and the Contractor by the Construction Administrator. A letter will be issued by the WCSU Project Manager and Contractor to Construction Administrator granting such occupancy and will state the terms and conditions of occupancy.

3. Prior to Agency occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Agency will operate and maintain mechanical and electrical systems serving occupied portions of the building.

4. The Architect will prepare a **"**Certificate of Substantial Completion" for the Work to be occupied prior to Agency occupancy. Use the "Certificate of Substantial Completion" form as required by the Owner.

5. The WCSU Project Manager will request a signed "Certificate of Compliance" from Commissioner of the Department of Administrative Services, Architect, and Contractor, if required.

6. A letter from the WCSU Project Manager to the Agency Representative with copy to the Contractor granting occupancy will state the terms and conditions of occupancy and that fire insurance coverage has been requested, the effective date of which will indicate to the Contractor that they may cancel fire insurance coverage for the project.

7. Upon occupancy, the Agency will assume responsibility for maintenance and custodial service for occupied portions of the building.

8. Work after Agency Occupancy:

8.1 For all work to complete the occupied building, warranty work, the balancing and commissioning of systems, repair of latent defects and adjustments after occupancy, the Contractor is responsible for all costs associated with working in occupied buildings.

C. No Occupancy: Agency will not occupy the building or any completed portions thereof prior to Substantial Completion of the Work.

1.6 MISCELLANEOUS PROVISIONS:

A. Examination of Site:

1. It is not the intent of the Documents to show all existing conditions. All Contractors and Subcontractors are advised to attend the Pre-Bid Meeting prior to submitting their Bid Proposals. This is the only official opportunity to visit and examine the site with the Owner, Agency, Architect, Engineer and Construction Administrator.

2. The Contractor should investigate and satisfy himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, uncertainties of weather, roads or similar physical conditions of the ground, the character of equipment, and facilities needed preliminary to and during the prosecution of the Work. The Contractor should further satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the Contract Documents. Any failure by the Contractor to acquaint himself with the available information shall not relieve him from the responsibility for estimating properly the difficulty and cost of successfully performing the Work.

3. No attempt has been made to locate hazardous material associated with existing site utilities, though it is presumed that at least some asbestos may be discovered associated with underground piping during the course of site and site utilities work. If and when such materials appear, the Contractor shall notify the Owner, who shall direct additional work outside of this Contract to assist in cutting up and disposing of same. The Contractor shall assist the hazardous materials contractor(s) with excavating, heavy lifting, and the like at no additional cost to the Owner.

B. Pre-Bid Meeting:

1. A Pre-Bid Meeting and tour of the site will be conducted as scheduled in Division 00 Section 00 11 16 "Invitation to Bid". This scheduled meeting is the only official opportunity for the bidders to tour the site with the Owner, Architect, Engineer, Construction Administrator, and Agency.

C. **Project Documents:**

1. The Specifications and Drawings are intended to describe and illustrate the materials and labor necessary for the work of this Project.

2. Throughout the Technical Specifications, the Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction Form 816, current edition including any interim and supplemental specifications are referenced. Where so referenced the requirements set forth therein are applicable and made a part hereof. Copies of Form 816 are available from the Connecticut Department of Transportation at a nominal charge.

D. **Site Logistics Plan(s):** Site Logistics Plan(s) for this Project are in the Contract Documents. The Site Logistics Plan(s) describe in detail the proposed use of the Site and Building, both inside and outside the Contract Limit Area.

1. **Related Section:** Section 01 31 00 “Project Management and Coordination”, 1.5 Submittals, A, (4).

2. The **Site Logistics Plan(s)** include, but are not be limited to the following information:

a. proposed vehicle and equipment access routes;
b. locations of proposed staging/lay-down and storage areas, utility connections;
c. delivery access of materials, handicap access;
d. building egress, proposed pedestrian traffic flows in the interior and exterior of the building;
e. temporary access-ways;
f. office trailer and dumpster locations;
g. location of perimeter construction fencing and gates;
h. other protection measures around and in the building(s);
i. temporary partitions, proposed pedestrian traffic flows around and in each building;
j. proposed building access points;
k. proposed protection measures for trees, shrubs and plantings, interior access-ways;
l. coordination of activities that relate to building occupants and other field applied measure to protect and coordinate the work including any relocation of utilities.

E. **Scope Review:**

1. Prior to signing a Contract with the State, WCSU will conduct a full scope review with the apparent Low Bidder to ensure that all of the requirements have been included within the bid. This scope review will highlight all of the specific requirements of the project, a review of the WCSU procedures and all of the Technical sections of the contract documents.

2. This process will ensure that all of the scope of work included in the contract documents has indeed been included.

F. **Specifications, Drawings, and Electronic Data Storage Devices Furnished:**

1. The Contractor shall receive Pending sets of the Contract Documents on or about the time of execution of the Contract, free of charge. If additional copies are wanted, they will be available at the direct additional cost of their reproduction, to the Contractor.

2. The Contractor shall receive one (1) set of AutoCAD compatible (latest version) Floor Plans on Electronic Data Storage Devices at no cost on or about the time of execution of the Contract from the Architect. Additional sets of AutoCAD compatible (latest version) Floor Plans on Electronic Data Storage Devices from the Architect shall be available at the cost of their reproduction, to the Contractor.

G. **Construction Responsibility:**

1. The Contractor shall be responsible for his construction means, methods, techniques, sequences, and procedures employed in the performance of his work and shall have full responsibility for his failure to carry out any part of his work in accordance with the Contract Documents.

H. The Contractor shall request approval from the Owner to work overtime. Said request shall be made forty eight (48) hours in advance. All costs for overtime are included in the Contract Sum as stated in Division 00 Section 00 41 00 "Bid Proposal Form."

I. Pursuant to C.G.S. Sec. 4a-101, the Contractor shall compile evaluation information during the performance of the contract on each of its subcontractors who are performing work with a value in excess of five hundred thousand dollars ($500,000.00). The Contractor shall complete and submit to WCSU evaluations of each such subcontractor upon fifty percent (50%) completion of the project and upon Substantial Completion of the project. The Contractor acknowledges that its failure to complete and submit these evaluations in a timely manner may, by statute, result in a delay in project funding and, consequently, payment to the Contractor. The Contractor agrees to indemnify and hold the State harmless from any loss, damage, or expense that results from or is caused by the Contractor's failure to complete and submit the evaluations to WCSU in accordance with this provision.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 11 00

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. Identification and field mark out of all on-site utility lines to remain in operation during construction.

B. Identification and field markout of all off-site utility lines within construction work areas.

C. Submission of procedures to be used to ensure the safety of the utility.

D. Conduct test pit excavation at all proposed utility crossings prior to construction.

E. Repair of any damage during construction operations.

F. Relocate utilities that are indicated as such.

1.02 RELATED DOCUMENTS

A. Section 02 41 13 – Site Demolition

B. Section 31 00 00 - Earthwork

C. Section 31 23 33 - Trench Excavation and Backfill for Utilities

D. Section 31 23 16 - Excavation, Backfill and Subgrade Preparation for Pavement

E. Contract Drawings and Documents

1.03 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of capped utilities and utility lines encountered during construction.

B. Accurately record actual locations and elevations of existing utilities at proposed utility crossings prior to utility and storm sewer construction. Submit recorded data to Owner's Engineer for verification of proposed design.

1.04 REGULATORY REQUIREMENTS

A. Contractor shall notify all affected utility companies, agencies, authorities, owners, etc. at least 48 hours prior to the commencement of work or as required by each agency and shall comply with their requirements.

B. Contractor shall contact the "Call Before You Dig" service for an official utility mark out.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 IDENTIFICATION

A. Prior to commencement of work, contractor shall locate all existing utilities which are to remain in service and/or require relocating during construction as shown on the Contract Drawings. Contractor shall record location, depth from existing grade, size and type of existing utility. If existing utilities are in conflict with proposed improvements shown on the contract drawings, it shall be the responsibility of the contractor to inform the Owner and Owner's Engineer prior to commencement of work to determine alternate resolutions of conflict. Contractor shall take responsibility of utility relocation in the absence of such coordination prior to commencement of work.

3.02 PROTECTION

A. Flag, barricade or suitably protect existing utilities during construction operations and equipment movement. Install shoring and bracing as required.

B. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction.

3.03 LATERAL DISCONNECTION

A. Where a utility line is to be disconnected from portions to remain, the lateral pipes shall be cut and suitably plugged/capped in accordance with the Contract Drawings and applicable utility or agency requirements.

3.04 REPAIRS

A. Any damage to existing, operational utilities by the Contractor or his subcontractors during the on-going construction operation shall be immediately repaired to operational standards at the Contractor's expense. If the repairs are not immediately addressed by the Contractor, the utility owner and/or the Owner shall have the right to contract for the repair at the Contractor's expense

3.05 RELOCATIONS

A. Where utility lines are designated to be relocated, construct new utilities as shown and in accordance with these specifications and then remove former service to minimize disruption to the best extent practical. This operation shall be coordinated with the appropriate Authorities, as necessary.

B. Coordinate with the Owner for necessary shut-offs or temporary disruption to existing services.

END OF SECTION 02 01 00

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall employ a Connecticut Licensed Land Surveyor to do all necessary surveying required to construct all elements of the Project as shown on the Contract Drawings and specified herein.

B. Once survey items are laid out, it is the contractors' responsibility to ensure that all survey stakes are protected and that data remains in good usable condition. Should the survey marks or data need to be replaced, additional survey work will be the responsibility of the contractor, and will be performed at no additional cost to the Owner.

C. All surveys shall be signed and sealed by the Contractor's Land Surveyor, licensed to practice in the State of Connecticut.

D. All project installations improperly constructed as a result of Contractor error shall be properly relocated by the Contractor at no cost to the Owner.

1.02 RELATED DOCUMENTS

A. Section 31 00 00 - Earthwork

B. Section 32 12 16 - Asphaltic Concrete Paving

C. Section 32 13 13 - Concrete Paving

D. Section 32 16 13 - Curbs and Sidewalks

E. Section 10 14 53 - Traffic Control Signage

F. Section 26 56 00 - Site Lighting

G. Section 33 41 00 - Storm Sewer System

H. Section 22 13 13 - Site Sanitary Sewer

I. Section 33 71 00 - Utilities

J. Contract Drawings and Documents

1.03 REFERENCE STANDARDS

A. In accordance with local rules and regulations.

1.04 QUALITY ASSURANCE

A. All construction layout work shall be performed under the direction of a Professional Land Surveyor.

B. The survey crew will discuss all layout procedures with the Contractor's supervisor prior to commencing work.

C. The survey crew daily report shall be filled out and signed by the Contractor's supervisor at the end of that day's layout.

D. Copies of sketches, cut sheets, etc. shall be provided to the Contractor by the end of the next workday.

E. All costs related to re-staking due to construction or Contractor's work resulting in destruction or movement of stakes shall be paid for by the Contractor and at no additional expense to the Owner.

F. Building dimensions to be coordinated with approved architectural plans.

G. Field dimensions to be coordinated with approved synthetic field plans.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide all instruments, equipment, stakes, marking paints and other materials necessary to perform the work satisfactorily.

PART 3 - EXECUTION

3.01 GENERAL

A. Qualified personnel and adequate equipment shall be made available by the Contractor to maintain control points and layout all lines and grades throughout the duration of the Contract.

B. The exact position of all work points shall be established from control points, base line transit points and/or other points of similar nature based upon information provided in Contract Documents.

C. The Contractor shall establish, re-establish when necessary and maintain control points throughout the life of the Contract to permit the Engineer to make the necessary preliminary, interim and final measurements and to check the Contractor's layout.

D. The Contractor shall be responsible for the preservation of all control points. If control points are damaged, lost or moved, they shall be reset at no additional expense to the Owner. Control points outside as well as inside the Contract Limits shall be used for construction.

E. The Contractor shall provide and maintain offset stakes for each base line, at each station, and out of the limits of grading and construction. Each stake shall be identified and marked to show the offset distance from the base line and the Contractor shall furnish sheets showing cuts and fills to the finished profile and cross section lines.

F. Any error, apparent discrepancy or absence of data shown or required for accurately accomplishing the survey work shall be referred to the Owner's Engineer for interpretation or furnishing when such is observed or required.

G. The Owner's Engineer may check all or any portion of the survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor. Such verification by the Owner's Engineer shall not relieve the Contractor of any responsibilities for the accuracy and completeness of his work.

H. The Contractor shall keep a survey transit and level with tripod and survey rod on the project at all times to be used for checking inverts, surveyor's stakes, etc.

I. The Contractor shall submit all survey data for daily checks, to the office of the Owner's Engineer after the data is obtained.

J. The Contractor shall submit cut sheets for the Owner's Engineers approval prior to any construction activity, for the purpose of verifying the construction layout. Cut sheets for any particular item of

work shall be submitted prior to the need for approval. All cut sheets shall be prepared by a Licensed Land Surveyor and shall bear his seal and signature.

K. In cases where extra excavation is required, before and after cut sheets shall be submitted for determination of quantities for excavation and backfill and extra bedding.

L. All project installation improperly constructed or located as a result of inadequate or erroneous survey layout shall be relocated or reconstructed, after demolition and/or removal of the improper work as necessary, by the Contractor at no charge to the Owner.

3.02 LAYOUT

A. Building Layout – Set a minimum of 6 corners with 2 offsets per corner. Also included will be a finished floor elevation and/or benchmark within close proximity to the proposed building.

B. Curb Layout – Stakes will be located at 50-ft stationing and also at the point of curvature, points of tangency and radius points with 4-ft offsets to the face of the curb. Cut sheets shall be provided to the Contractor by the Surveyor.

C. Storm drainage and sanitary sewer lines (including manholes and catch basins) – Stakes will be located at 50-ft stationing along the centerline of the utility at 15-ft offsets. Manholes and catch basins will have 2 offsets per structure. Cut sheets shall be provided to the Contractor by the Surveyor.

D. Water Layout – Offset stakes will be located at deflections and at hydrant locations. Hydrant elevations will be to grade ring.

E. Grade Stakes – Stakes will be located @ 50 ft. stationing along the centerline of the roadway at finished grade elevations. Off roadway areas will be at a 50 ft. grid at finished grade elevations. Cut sheets shall be provided to the contractor.

F. Lighting Layout – Centerline of lighting structure with 5-ft offsets and finished grade elevations.

G. Allowable tolerances for the project shall be generally as follows:
1. Structural work, site furnishings: horizontal location 0.1 feet; vertical elevation 0.01 feet.
2. Paving, fine grading: vertical elevation 0.1 feet.
3. Trees: horizontal location 0.5 feet.

END OF SECTION 02 21 13

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, supervision, materials, tools and equipment necessary for, or incidental to the completion of the formwork for cast-in-place concrete as shown on the Contract Drawings and/or as specified.

B. Built-In Inserts

1. Install built-in anchors, anchor bolts, inserts, sleeves, angles, bolts, etc, as required under other Divisions shall be furnished by such trades.

1.3 RELATED WORK

A. Section 03 20 04 - Concrete Reinforcement
B. Section 03 30 04 - Cast-in-Place Concrete

1.4 QUALITY ASSURANCE

A. Design Criteria

1. Design of formwork shall conform to ACI 318 Chapter 6 and ACI 347, Chapter 2. The design and engineering of the formwork, as well as the construction, shall be the responsibility of the Contractor. Formwork shall be designed to support gravity and wind loads as specified by the State Building Code. Allowable stresses shall meet applicable requirements of the State Building Code.

2. Formwork shall be mortar tight, sufficiently rigid and strong to prevent sagging or springing between supports and to maintain true position and shape during and after placing of concrete, without waves, bulges, or other defects in finished concrete surfaces.

3. Erection and removal of formwork shall conform to the requirements of ACI 301, Section 2, except as modified herein.

B. Allowable Tolerances

1. Erect and maintain concrete forms so as to insure completed work within the tolerance limits of ACI-117, unless otherwise noted in the Contract Documents.

1.5 SUBMITTALS

A. Contractor shall submit shop drawing to the Engineer for review of temporary shoring locations and locations of any construction, control or expansion joints to be used in all walls and slabs, as outlined in Section 03 20 04 Concrete Reinforcement.

B. The Contractor shall submit fully detailed shop drawings for all permanent metal forms to the Engineer for review. Shop drawings shall include form thicknesses, physical dimensions, accessories, coatings and method of attachment to supporting structure.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conform with ACI 347, Chapter 3.

B. Unexposed surfaces may be formed with dressed matched lumber, free from loose knots or major defects.

C. Exposed concrete surfaces shall be formed with three-quarter (3/4") inch thick sound plywood without patches, A.P.A. Plyform Ext. B-B, using a minimum of pieces and placed symmetrically.

D. Chamfer strips shall be new half-inch (1/2") 45 degree wood strips, nailed six (6") inches on center, and installed in inside corners of forms.

E. Form releasing agent shall be a clear, non-staining material the approved equal of Nox-Crete.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall notify the Engineer twenty-four (24) hours prior to placing foundation forms for examination of soil bearing material.

3.2 PREPARATION OF WOOD FORM SURFACES

A. All forms shall be coated with a non-staining form release agent compound before the reinforcement is placed.

B. Forms shall be thoroughly cleaned and recoated with form release agent before re-use.

3.3 INSTALLATION OF TEMPORARY FORMS

A. Construct forms to shape, grade and dimensions shown, sufficiently tight to prevent leakage. Joints shall be placed on true vertical and horizontal axis.

B. Side forms shall be used for footings and grade beams.

C. Erect formwork and adequately support, brace and maintain so as to safely support construction loads and to remain in correct position during and after placing concrete without displacement.

D. Forms for external corners of exposed members shall be accurately fitted and securely fastened. Install beveled chamfer strips nailed at six (6") inches on center, in corners of all exposed members to provide a three-quarter (3/4") inch chamfer, measured at the diagonal face.

E. Forms shall be recessed to receive anchor bolts and bearing plates.

F. Formwork shall be pitched as required to meet finished slab elevations as shown on the Contract Drawings, to maintain the depth of any slab or beam. Camber formwork as shown on Contract Drawings to meet tolerances.

G. Attach to formwork as required items such as preformed reglets, and any other anchors, inserts, bolts, or sleeves. Coordinate with requirements of all other Divisions' work for proper lines and spacing.

H. Provide cleanout panels at bottom of walls and columns for cleaning and inspection.

I. Keys shown shall be two (2") inches deep by one-third (1/3) the total thickness, and beveled unless otherwise noted.

3.4 WALL CONSTRUCTION JOINTS

A. Unless otherwise shown on the Drawings, foundation walls shall have vertical construction joints located no more than sixty-five (65') feet apart. No vertical construction joint shall be within four feet zero inches (4'-0") of any column pier, corner or footing joint.

B. See Section 03 30 04 for Slab Construction Joint Requirements.

3.5 TIES

A. Where vertical surfaces are exposed in either exterior or interior areas, use wood cone snap ties with one and one-half (1 1/2") inch break back.

B. Locate form ties for exposed concrete in horizontal rows and vertical tiers. Drill forms to suit ties used. Do not splinter forms by driving ties through improperly prepared holes.

3.6 REMOVAL OF FORMWORK

A. The Contractor shall be solely responsible for construction during and after form removal.

B. Formwork for footings may be removed twenty-four (24) hours after placing of concrete.

C. Formwork not supporting the weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may not be removed in less than seventy-two (72) hours after placing the concrete, and provided that curing and protection operations are maintained.

D. Formwork supporting the weight of concrete, such as beam soffits, joists, slabs and other structural elements of work, may not be removed in less than fourteen (14) days or until the concrete has attained a minimum strength to carry its own weight and any approved superimposed load, which at no time shall exceed the design live load of that floor.

E. No construction loads exceeding the dead load plus live load shall be supported on any unshored portion of the structure under construction. No construction loads shall be supported on, nor any shoring removed from, any part of the structure under construction except when that portion of the structure in combination with the remaining forming and shoring system has sufficient strength to support safely its weight and the loads placed thereon.

F. Exercise care in form removal to prevent chipping of corners or other damage to concrete. Any damage to concrete shall be patched as per Section 03 30 04 Cast-in-Place Concrete.

END OF SECTION 03 10 04

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, supervision, materials, tools and equipment necessary for, or incidental to completion of the concrete reinforcement for cast-in-place concrete as shown on the Contract Drawings and/or specified.

1.3 RELATED WORK

A. Section 031004 - Concrete Formwork
B. Section 033004 - Cast-in-Place Concrete

1.4 QUALITY ASSURANCE

A. Allowable tolerances: Fabricating and placing tolerances as outlined in ACI 301, Section 3, except as modified by these specifications.

1.5 SUBMITTALS

A. Shop Drawings

1. The Contractor shall submit detailed drawings which clearly show location, splicing, cover, sizes, and spacing of all reinforcing and wire fabric. Schedules and diagrams shall indicate bends, sizes, and lengths of reinforcing members. All reinforcement in concrete walls and grade beams shall be shown in elevation one eighth inch equals one foot zero inch (1/8" = 1'-0") scale. All construction joints, as required on the Contract Drawings or requested by the Contractor, shall be shown with any additional reinforcement required. Show and locate all concrete openings, including those required for other Divisions. Any drawings submitted without showing construction joints and openings will be rejected and will not be reviewed.

B. No reinforcing shall be cut, fabricated, shipped on the job site or placed before shop drawings are reviewed. Only shop drawings bearing the Engineer's stamp marked "Furnish as Submitted" or "Furnish as Corrected" shall be used in the field.

C. Certificate

1. The manufacturer shall submit to the Engineer certified test results stating that the reinforcing steel and welded wire fabric conform to the chemical composition and tensile and bending requirements as outlined in ASTM A615 and ASTM A185.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to the project site in bundles, marked with metal tags indicating bar size, grade and length.

B. Store reinforcing on skids or other supports above ground and protect from any damage or surface contamination, which would impair its bonding qualities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All reinforcing bars shall conform to the requirements of ASTM A615, Grade 60.

B. Welded wire fabric shall conform to the requirements of ASTM A185.

C. Metal Accessories

1. Provide all spacers, chairs, ties, clips and other devices required for proper placement.

D. Epoxy adhesive shall be HIT HY 200 as furnished by Hilti, Inc., Tulsa, Oklahoma.

2.2 FABRICATION

A. Bar reinforcing shall be fabricated cold to dimensions given on the Contract Drawings. Conform to ACI standards 318 and 315 for forming hooks and bends and for detailing, fabricating, and erecting reinforcement.

B. Reinforcing shall be accurately formed to dimensions on drawings, details and schedules within the following tolerances:

Sheared Length.....±1 inch
Stirrups, Ties and Spirals.....±1/2 inch
All Other Bends.....±1/2 inch

C. Reinforcing shall be bent cold and shall not be straightened or bent in a manner that will injure the materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall notify the Engineer twenty-four (24) hours prior to placing concrete to inspect secured reinforcing. No concrete shall be placed until reinforcing has been inspected.

3.2 INSTALLATION

A. Placement

1. Reinforcement shall be free of paint, dirt, oil, or excessive scale or rust that might reduce its bond strength with concrete.

2. Reinforcement shall be accurately placed and secured against displacement before and during the placing of concrete. Provide metal chairs, supports, and spacers to secure steel in correct horizontal and vertical position. Conform to "Recommended Practice for Placing Reinforcing Bars" (CRSI) in spacing of bolsters for slab and beam bottom reinforcing and in spacing of support bars on continuous high chairs for top slab reinforcement. The use of individual high chairs is prohibited.

3. No welding of bars will be allowed.

4. For exposed concrete in soffits or ceilings, bar supports shall be stainless steel, plastic, or have plastic ends of an approved type in contact with forms.

5. Reinforcement shall stop at expansion joints and continue through construction joints.

6. All reinforcing bars shall be supported and wired together to prevent displacement by construction loads or the placing of concrete beyond the tolerances specified below. On ground, solid concrete blocks, made of 3000 psi concrete, shall be used to support any reinforcing bars in slabs. Surfaces of blocks shall be sufficiently rough to insure proper bond with cast-in-place concrete. Reinforcement shall be secured against displacement with annealed iron wire ties or suitable clips at all intersections, except reinforcing for footings may be wired at alternate intersections.

B. Cast-in-Place Concrete Reinforcing Cover

1. Footing and grade beams cast against and permanently exposed to earth .....3"

2. Walls, #6 bars and larger .....2"

3. Piers, #5 bars, 5/8 in., wire and smaller .....1 1/2"

4. Structural Slabs:

   a. Not exposed to weather or in contact with the ground .....3/4"
   b. Exposed to weather or in contact with the ground .....1"

5. Beams, girders, columns: Principal reinforcement, ties, stirrups or spirals .....1 1/2"

C. Reinforcing Placing Tolerances

1. Place reinforcing as shown on drawings and schedules within the following tolerances:

   Cast-in-Place Concrete Cover
   to Formed Surfaces ..... + 1/4 inch

   Depth to Steel Reinforcing of:
   24" or Less..... + 1/4 inch
   More than 24" ..... + 1/2 inch

   Longitudinal Location of Bends
   and Ends of Bars, Except at
   Ends of Members..... + 2 inches

D. Splicing

1. Lap splices - tie securely with wire to prevent displacement during placement of concrete.

2. Splice bars only at the locations and to the lengths shown on the Contract Drawings or as accepted on the Shop Drawings.

E. Welded Wire Fabric

1. Fabric shall be shipped in flat sheets.

2. Wire fabric end and side laps shall be even multiple of wiring spacing and shall be not less than six (6") inches.

3. Wire fabric reinforcement for structural slabs shall be supported on continuous high chairs at all slab support member locations.

4. Wire fabric reinforcement for slabs on grade shall be placed in the upper third of slab depth.

5. Wire fabric for slabs on grade shall be supported on masonry blocks or other suitable supports at a spacing not to exceed four feet zero inch (4'-0") on center.

6. All exterior slabs on grade shall contain welded wire fabric unless otherwise noted.

END OF SECTION 03 20 04

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, supervision, materials, tools and equipment necessary for or reasonably incidental to completion of all cast-in-place concrete as shown on the Contract Drawings and/or specified herein.

B. Work shall include all footings, piers, walls, slabs on grade, retaining walls, grade beams, structural slabs, concrete stairs and platforms and beams shown on the Contract Drawings.

C. Pads and miscellaneous concrete as required for Mechanical and Electrical Divisions.

D. Set anchor bolts and leveling plates specified in Division 5, Structural Steel.

E. Place all anchors, inserts, dovetail slots, hangers, sleeves and etc. which must be encased in concrete for other Divisions.

1.3 RELATED WORK

A. Section 03 10 04 – Concrete Formwork
B. Section 03 20 04 – Concrete Reinforcement

1.4 QUALITY ASSURANCE

A. Standards

1. Concrete work shall conform to all requirements of ACI-301 “Specifications for Structural Concrete” latest edition.

2. Design of concrete shall conform to all requirements of ACI-318 “Building Code Requirements for Structural Concrete” latest edition.

B. Testing Agency

1. The Owner will engage and pay for an independent commercial testing laboratory to test concrete used on this project.

2. Testing required under Section 2.02, Proportions, shall be by an independent commercial laboratory as approved by the Engineer, and at the Contractor's expense.

C. Quality Control

1. Compression Tests

a. Tests shall be made in conformance with ASTM C39. Each test shall consist of four (4) cylinders made and tested by the laboratory during the progress of the project, testing as follows:

i. One (1) - after curing seven (7) days in the field.
ii. Three (3) - after curing twenty-eight (28) days in the laboratory.

b. At least one (1) test shall be made every one hundred (100 cy) cubic yards of concrete or fraction thereof, placed in any one concreting operation on any given day.

c. Concrete for each set of cylinders shall be from any one (1) sample, representative of the entire batch.

d. Specimens shall be made, cured and tested in accordance with ASTM C31.

e. When concrete is pumped, test cylinders shall be made from concrete taken at the discharge end of the pumping train.

2. Additional tests as follows shall be made from the concrete taken to mold the cylinders.

a. Slump test - in accordance with ASM C143.

b. Air-entrainment test - in accordance with ASTM C173 or ASTM C231.

3. The Contractor shall notify the Engineer and the testing laboratory twenty-four (24) hours before concrete placement and shall cooperate in making of cylinders by the testing laboratory.

1.5 SUBMITTALS

A. Test Reports

1. Report of tests shall be submitted to the Engineer and shall include: name of job, date and location of placement, class of concrete, mix data, and slump, air content, compressive strength, age and condition of test cylinders, weight of each cylinder tested for 7 day break, type of fracture, and method of curing.

2. One (1) copy of all test reports shall be promptly forwarded by the testing laboratory to the Engineer, plus one (1) copy each to the Architect, Contractor and Concrete Supplier.

B. Test Results

1. The average of the tests for any portion of the structure shall equal or exceed the specified twenty-eight (28) day compressive strength (fc).

2. No single strength test shall have a value less than 90% of the specified compressive strength (fc).

3. Where the concrete does not comply with these requirements, the Engineer may require other tests, such as cored cylinders (in conformance with ASTM C42) or load tests, all at the Contractor's expense. Should the concrete fail to pass such tests, it shall be removed and replaced at no additional cost to the Owner. In addition, the Contractor may be required to remove and replace sound portions of structure as necessary to insure safety, appearance, and durability of the structure. Additional load tests strengthening or removal and replacement of parts of structure and any costs associated with delay of projects shall be at Contractor's expense.

C. Concrete Proportions

1. See Section 2.02A thru 2.02J for additional requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: domestic portland cement conforming to ASTM C150, Type I or Type II.

B. Fine aggregate: natural sand conforming to ASTM C33.

C. Coarse aggregate: crushed stone or crushed washed gravel conforming to ASTM C33.

D. Water: clean, potable.

E. Admixtures: Each admixture shall be approved by the Engineer. No admixtures containing calcium chloride or other water soluble chlorides will be allowed. Each manufacturer shall submit a written notarized statement to the Engineer of the chloride content of each admixture. Formulate admixtures to avoid an increase in water-cement ratio or loss of strength.

1. Air entraining agent: ASTM C-260.

2. Retarder - Densifier: ASTM C-494, Type D.

3. Accelerator: ASTM C-494 Type C.

4. Water-reducing agent: ASTM C-494, Type A.

F. Non-shrink non-metallic grout: CE CRD C-621.

G. Curing and sealing compound: Fed. Spec. TT-C-800A Type I, ASTM C-309.

H. Polyethylene film: white opaque, reinforced six (6) mils thick.

I. Curing paper shall be the approved equal of Sisalkraft Paper "Orange Label" that conforms with ASTM C171, Type I.

J. Premolded joint filler shall be a preformed bituminous expansion type that conforms to ASTM D-994. Joint material thickness shall be one-half (1/2") inch thick, except as otherwise indicated on the drawings.

2.2 PROPORTIONS

A. Concrete mix proportions shall be selected to produce an average compressive strength exceeding the required twenty-eight (28) day compressive strength (fc) in accordance with ACI 318 Chapter 5.3, proportioning on basis of field experience, or trial mixtures, or both. The Contractor shall submit to the Engineer the concrete strength to which the materials were proportioned, and copies of any records that the concrete supplier may have showing standard deviations in previous mixes.

B. Mix proportions shall be as outlined in ACI 301Section 4 by the testing laboratory.

C. Where a concrete production facility has a record, based on at least thirty (30) consecutive strength tests that represent similar materials and conditions to those expected, required average compressive strength used as the basis for selecting concrete proportions shall exceed required fc at designated test age by at least:

400 psi if standard deviation is less than 300 psi
550 psi if standard deviation is 300 to 400 psi
700 psi if standard deviation is 400 to 500 psi
900 psi if standard deviation is 500 to 600 psi

1. If standard deviation exceeds 600 psi, concrete proportions shall be selected to produce an average strength at least 1200 psi greater than required fc.

D. Strength test data for determining standard deviation shall be considered to comply with Section 2.02C, if data represents either a group of at least thirty (30) consecutive tests or a statistical average for two (2) groups totaling thirty (30) or more tests.

E. Strength tests used to establish standard deviation shall represent concrete produced to meet a specified strength or strengths within 1000 psi of that specified for the proposed work.

F. Changes in materials and proportions within the population of background tests used to establish standard deviation shall not have been more closely restricted than for the proposed work.

G. After sufficient experience and test data become available from the job, using ACI 211 methods of evaluation, the standard deviation may be reduced when the probable frequency of tests more than 500 psi below required compressive strength will not exceed one in one-hundred (1 in 100), and that probable frequency of an average of three (3) consecutive tests below required compressive strength will not exceed one in one hundred (1 in 100).

H. If it is intended to place any concrete by pumping, a corresponding mix shall be designed for such placement and so designated.

I. No concrete shall be placed until tests of design mixes show a twenty-eight (28) day average compressive strength at least equal to the specified design compressive strength or until the concrete design mix proportions have been accepted by the Engineer.

J. Contractor shall submit the following data:

1. Fine aggregate - organic content, sieve analysis, fineness modulus and specific gravity.

2. Coarse aggregate - sieve analysis and average weight loss in accordance with ASTM C-33.

3. Mix design, including cement brand, proportions of aggregate by weight, slump, water-cement ratio, percentage of air.

4. Thirty (30) twenty-eight (28) day compressive test results on proposed mix that comply with Section 2.02C.

5. Admixture-types, brand and quantity.

2.3 SPECIFIC REQUIREMENTS

A. Concrete for all the parts of the work shall be 3,000 psi at twenty-eight (28) days and meet the values shown in the following Table:

Min. compressive strength @ 28 days (psi)	3,000
Slump (inches)	2 1/2 - 4
Max. size coarse aggregate (inches)	1 1/2
Max. size coarse aggregate for suspended slabs and pumped concrete (inches)	3/4
Max. size coarse aggregate for minimum 5 inch thick slab on grade (inches)	1 1/2
Min. cement factor (sacks per cy)	5 1/2

1. Water content shall include surface water in aggregates.

B. Concrete for Interior Slabs shall also conform to the following requirements:

Min. compressive strength @ 28 days (psi)	3,000
Maximum water cement ratio shall be	0.48
Min. cement factor (sacks per C.Y.)	5 1/2

1. Mix shall include a mid-range water reducer such as Polyheed 997 as manufactured by Master Builders, Inc. or equivalent.

2. Mix shall be proportioned to provide a maximum 5" slump at point of discharge.

3. Interior concrete slabs-on-grade shall not be air entrained.

C. Concrete for exterior flatwork shall be 4,000 psi at twenty-eight (28) days and meet the values shown in the following Table:

Min. compressive strength @ 28 days (psi) 4,000
Slump (inches) ..... 2 1/2 - 4
Max. size coarse aggregate (inches) 1 1/2
Max. size coarse aggregate for suspended slabs and pumped concrete (inches) 1
Max. size coarse aggregate for minimum 5 inch thick slab on grade (inches) 1 1/2
Min. cement factor (sacks per cy) 6 1/2

1. Water content shall include surface water in aggregates.

D. All concrete exposed to the weather, including site work, shall be air-entrained as follows:

Maximum Size Aggregate	Air Content % by Volume
1 1/2 inch	4 - 7
1 inch	4.5 - 7.5
3/4 inch	4.5 - 7.5
1/2 inch	5.5 - 8.5
3/8 inch	6 – 9

E. Variations of proportions may be permitted to produce more workable materials on approval by the Engineer.

PART 3 - EXECUTION

3.1 PRIOR TO PLACING CONCRETE

A. Soil bottoms for footings and slabs shall be accepted by the Engineer before placing concrete. The subgrade shall be free of frost before concrete placing begins.

B. All debris, sawdust, ice, etc., is to be cleaned from place of deposit before concrete is placed.

C. All water is to be removed from place of deposit before concrete is placed. Provide drainage or pumping as required to maintain dry excavation until concrete has taken initial set.

D. All conduits and piping are to be dug into subgrade sufficiently so as to provide uniform slab thickness.

E. Prior to placing any concrete, the Contractor shall notify the Engineer twenty-four (24) hours in advance so that formwork and reinforcing may be inspected. Do not place concrete until inspection has been made or waived.

F. All dowels, anchor bolts, sleeves, inserts and other embedded items shall be set with the aid of templates and shall be securely positioned in place prior to the placement of concrete.

3.2 MIXING

A. Concrete shall be ready-mixed in conformance with the requirements of ASTM C94 for measurement of materials, batching, mixing and delivery, and shall be discharged within one and one-half (1 1/2) hours after water is first added to the mix, except that in unusually hot weather, this maximum time may be reduced.

B. Mixing and conveying equipment shall be thoroughly clean and free from hardened concrete and foreign materials before concrete operation is started.

C. All materials including water shall be added to ready-mixed concrete at the batching plant. Water shall not be added to the mix on the project site. Mixing shall be continued for at least one and one-half (1 1/2) minutes prior to its use.

D. Mixer shall produce thoroughly mixed, uniform mass, and discharge mixture without segregation. Entire batch shall be discharged before mixer is recharged.

E. Partially hardened concrete shall not be retempered or used.

F. Delivery Tickets

1. One (1) copy of all concrete delivery tickets shall be furnished to the Engineer on request. Contractor shall note on tickets location of placement. Delivery tickets shall provide the following information:

   a. Date and truck number
   b. Name of ready-mix batch plant
   c. Contractor and job location
   d. Cement brand, type mix number and weight in pounds
   e. Fine aggregate weight in pounds
   f. Maximum size of aggregate
   g. Coarse aggregate weight in pounds
   h. Water in gallons
   i. Admixture, name and amount in concrete, if any
   j. Amount of concrete in cubic yards
   k. Time mix left plant

3.3 DEPOSITING CONCRETE

A. Depositing of all concrete shall be in accordance with ACI 304.

B. Concreting shall conform to the requirements of ACI 305 or ACI 306 in hot or cold weather as required. See Section 3.07.

C. All Contractors whose work is related to the concrete or must be supported by it shall be given ample notice and opportunity to introduce and/or furnish embedded items before the concrete is placed.

D. Unless adequate protection is provided, and approved by the Engineer, concrete shall not be placed during rain, sleet, or snow.

E. Concrete shall be conveyed from the mixer to the place of final deposit in a practically continuous flow by methods which will prevent the separation or loss of the ingredients. It shall be placed in the forms or on grade as nearly as practicable to its final position and shall be thoroughly vibrated around all reinforcing bars and mesh to assure complete absence of voids. Under no circumstances shall partially hardened concrete be placed in the work. Concrete shall be prohibited from free-falling in excess of four (4) feet.

F. Concrete may be pumped. Use of aluminum alloys in the pumping train is prohibited.

G. Concrete shall be thoroughly compacted and worked into the forms and around the reinforcing by means of suitable mechanical vibrators. Sufficient vibrators shall be on hand to allow for breakdowns. Vibrators shall be run deep into the concrete and shall remain in one position until the concrete is thoroughly compacted, but not long enough to cause segregation of the aggregates.

H. Vertical lifts shall not exceed eighteen (18") inches. Vibrate through successive lifts to avoid pour lines. Vibrate first lift thoroughly until top of lift glistens to avoid stone pockets, honeycomb, and segregation.

I. Concrete shall be deposited continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within section. If section cannot be placed continuously between planned construction joints, as specified, field joint and additional reinforcement shall be introduced so as to preserve structural continuity. Engineer shall be notified in any such case.

J. Unless otherwise permitted, the work shall be so executed that a section begun on any day shall be completed in daylight on the same day.

K. Cold joints, particularly in exposed concrete, including "honeycomb", are unacceptable. If they occur in concrete surfaces exposed to view, Engineer may require that entire section in which blemish occurs be removed and replaced with new materials at Contractor's expense.

3.4 CONSTRUCTION AND CONTROL JOINTS

A. Walls, Columns, Beams, and Slab on Grade, and Structural Slab

1. No additional construction joints, except those shown on the Contract Drawings, accepted on the shop drawings, or accepted by the Engineer will be allowed.

2. The surface of the concrete at all joints shall be hard and thoroughly cleaned prior to placing adjoining concrete.

3. The cured or partially cured concrete of construction joints, except at locations noted below, shall be dampened (but not saturated) immediately prior to the placing of fresh concrete.

4. The face of hardened concrete joints in exposed work and joints in the middle of beams, girders and slabs shall be dampened (but not saturated) and then thoroughly covered with a coat of neat cement grout of similar proportions to the mortar in the concrete. The grout shall be as thick as possible on vertical surfaces and at least one-quarter (1/4") inch thick on horizontal surfaces. The fresh concrete shall be placed before the grout has attained its initial set.

5. Construction joints shall be constructed with reinforcing continuous through joint unless otherwise shown. All key bulkhead joints shall be constructed with a key depth of one-third (1/3) the total thickness unless otherwise shown.

6. Sawcut control joints in slabs shall be saw cut within twenty-four (24) hours of concrete placement. Control joint shall be sawed to depth of one-quarter (1/4) of the slab thickness.

7. Unless otherwise shown on the Drawings, slabs on grade shall be broken down into sections with control and/or construction joints that do not exceed six hundred fifty (650 sf) square feet area and whose dimensions do not exceed a one and one-half to one (1 1/2 to 1) ratio.

3.5 FINISHED CONCRETE SURFACES

A. Walls

1. It is the intent of this Specification that forming operations be performed in a manner which will produce sound concrete surfaces, free of bulges and offsets, with a minimum of fins, blemishes due to form defects and honeycomb areas.

2. Any exposed concrete which is not formed as shown on the Plans, or for any reason is out of alignment or level beyond tolerance specified, or shows a defective surface, shall be considered as not conforming with the intent of these Specifications; and shall be removed from the job by the Contractor, at his expense, unless the Engineer grants permission to patch the defective area.

3. Immediately after removing forms, all concrete surfaces shall be inspected and any pour joints, voids, pockets, or other surface defects shall be repaired at once, before the concrete is thoroughly dry.

4. Cut out surface defects which do not impair structural strength to 1 inch depth and refill with fresh concrete. Thoroughly wet cuts immediately prior to filling with stiff concrete of approximately the same mix as the adjoining work. After a partial set, compress and rub to produce a finish similar in texture and color to adjoining work.

5. Clean all exposed surfaces, concrete and adjoining work stained by the leakage of concrete.

6. Remove wood cones remaining after the rods are snapped off, and fill holes with a concrete mortar

finished to the same color and texture of surrounding concrete.

7. All surfaces on both the interior and exterior, which are exposed or are within six (6) inches of being exposed in the completed building, shall have a "rubbed finish" (i.e., smooth rubbed finish, or grout cleaned finish). Parging will not be accepted. Finish all rubbed concrete surfaces in accordance with ACI 301, Section 5.3.3.4.

8. Do not clean, rub or patch in freezing temperatures, or when frost is on concrete surface.

9. Permission to patch does not imply waiver of Engineer's right to require complete removal and replacement of said work if, in Engineer's opinion, said patching does not satisfactorily restore quality and appearance of work.

B. Slabs Finishing

1. All interior concrete slabs shall be finished by screeding, floating, floated finish, and steel troweled to a smooth even surface in accordance with ACI 301, Section 5.3.4, unless otherwise noted.

2. All exterior steps and slabs and interior slab scheduled for toppings shall be finished by screed floating, floated finish and broom finish in accordance with ACI 301, Section 5.3.4.

3. Any slab surface finish not specified shall be finished in accordance with ACI 301, Section 5.3.4.2.j.

4. No dry cement or other materials shall be applied to surface of any concrete slab to absorb moisture prior to finishing.

5. Provide a positive pitch to all floor drains as shown. Pitch exterior slabs away from the building as shown on the Drawings.

6. Provide one-eighth (1/8) inch radius tooled edging at all exposed slabs and/or sidewalk edges.

7. Provide proper depression in concrete to accept specified finish floor materials.

C. Stairs

1. Stair treads, landing slabs, and platforms shall be floated and given a troweled finish, as outlined above.

3.6 CURING

A. All concrete shall be kept constantly moist and protected against any drying action for not less than seven (7) days after placing of the concrete, and shall be accomplished in the following manner:

1. Walls, Beams and Columns

a. Formwork shall not be removed for a minimum of three (3) days.
b. For the remainder of the curing period, the concrete shall be kept moist by the application of absorptive mats or other moisture retaining covering as accepted by the Engineer, kept continuously wet or curing compounds. Application of curing compound is to follow immediately behind form removal to prevent surface from drying out.

2. All slabs, either slab on grade or suspended slabs, shall be cured using curing paper.

3. Where concrete is cured by curing paper, cover surface immediately after finishing. Joints shall be lapped five (5") inches, and squeegee curing paper to remove wrinkles. Repair all rips and tears until end of curing period.

4. The use of curing compounds on exterior slab on grade construction (sidewalks) is not permitted.

3.7 CONCRETING PRECAUTION FOR WEATHER EXTREME

A. Cold weather: Precautions shall be taken when the temperature is at or below 40 degrees F, or at 45 degrees F and falling, in accordance with "Guide to Cold Weather Concreting", ACI 306.

1. Set up a proper enclosure and heat to 50 degrees F for at least four (4) hours before starting any pour.

2. Use a water-reducing admixture with an accelerated set, but do not use or rely upon any materials as an "antifreeze".

3. Use vented heaters with blowers so placed that they do not produce localized hot spots which may dry out the concrete.

4. Maintain the temperature of the concrete at not less than 50 degrees F for seventy-two (72) hours and at above freezing for an additional seven (7) days. The temperature shall then be allowed to drop gradually to the exterior air temperature before the enclosure is removed at the rate of not more than 5 degrees F per hour nor 50 degrees F in any twenty-four (24) hour period before discontinuing.

5. All frozen concrete shall be removed from the job and replaced.

B. Hot weather: Precautions shall be taken when the temperature is at or above 75 degrees F, or at 70 degrees F and rising, in accordance with "Guide to Hot Weather Concreting", ACI 305. No concrete shall be placed when the air temperature is above 90 degrees F, unless the air is still and relative humidity is above eighty (80%) percent.

1. Set up proper windbreakers for concrete surfaces wherever the relative humidity is less than 70% for slight air motion or 80% for light breezes.

2. Provide shade for placements otherwise exposed to the sun.

3. Concrete is to be at a temperature of 80 degrees F, or less when placed. If necessary, the batching plant shall cool the aggregate by spraying or by using chilled water or ice. All such water shall be accounted for as part of the mixing water.

4. Use an admixture with a retarded set.

5. All forms shall be thoroughly wetted at least daily, and more often when the relative humidity is low.

6. For slabs, maintain the required materials for curing at hand so they may be placed immediately upon steel troweling. When the concrete temperature of any slab goes above 100 degrees F, place a layer of sand on it and keep it continuously wet until the temperature is below 90 degrees F.

3.8 CONCRETE MOUNTS FOR MECHANICAL EQUIPMENT

A. Furnish and place all concrete platforms, curbs, piers, etc., required for mechanical equipment as called for in the Mechanical Drawings. Set all anchor bolts, etc., as required.

3.9 GROUTING

A. Install non-shrink grout under all structural steel column base plates, leveling plates and bearing plates.

B. Non-shrink grout shall be mixed in accordance with the manufacturer's printed instructions. Bedding grout shall be placed solidly between the bearing surface and base or plate to ensure that no voids remain. Finish edges at 45 degree bevel and properly cure grout.

END OF SECTION 03 30 04

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PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract applies to Work of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of each type of masonry work is indicated on drawings and schedule.

B. Types of masonry work required include:
1. Concrete Unit Masonry
2. Brick Masonry
3. Ground Face Concrete Masonry Units
4. Split Face Concrete Masonry Units

1.3 QUALITY ASSURANCE:

A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

B. Samples for Verification Purposes: Submit the following samples:

C. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work. Selected brick masonry unit should match the brick masonry of the existing hangar in texture and color.

D. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used. The mortar should match the mortar of the existing Hangar Building.

E. Provide a complete sample panel, on site, facing East on the Southeast corner of the building. This sample panel shall be 3’-4”.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

C. Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.

D. Store cementitious materials off the ground, under cover and in dry location.

E. Store aggregates where grading and other required characteristics can be maintained.

F. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 PROJECT CONDITIONS:

A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

C. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.

D. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

E. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

F. Protect sills, ledges and projections from droppings of mortar.

G. Cold Weather Protection:

1. Do not lay masonry units which are wet or frozen.
2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
3. Remove masonry damaged by freezing conditions.
4. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements.
5. For units with surface temperatures above 32 degrees F (0 degrees C), wet with water heated to above 70 degrees F (21 degrees C).
6. For units with surface temperatures below 32 degrees F (0 degrees C), wet with water heated to above 130 degrees F (54 degrees C).

H. Perform the following construction procedures while masonry work is progressing.
Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected with 10 degrees F (6 degrees C).

I. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):

1. Mortar: Heat mixing water to produce mortar temperature between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
2. Grout: Follow normal masonry procedures.

J. 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):

1. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.
2. Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature to 70 degrees F (21 degrees C) at end of work day.

K. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C):
1. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.
2. Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature of 70 degrees F (21 degrees C) at end of work day.
3. Heat both sides of walls under construction using salamanders or other heat sources.
4. Use windbreaks or enclosures when wind is in excess of 15 mph.

L. 20 degrees F (-7 degrees C) and below:
1. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
2. Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature of 70 degrees F (21 degrees C) at end of work day.
3. Masonry Units: Heat masonry units so that they are above 20 degrees F (-7 degrees C) at time of laying.
4. Provide enclosure and auxiliary heat to maintain an air temperature of at least
5. 40 degrees F (4 degrees C) for 24 hours after laying units.

M. Do not heat water for mortar and grout to above 160 degrees F (71 degrees C).

N. Protect completed masonry and masonry not being worked on in the following manner.
1. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.

O. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):
1. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

P. 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):
1. Completely cover masonry with weather-resistive membrane for at least 24 hours.

Q. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C):
1. Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 38 hours for grouted masonry.

R. 20 degrees F (-7 degrees C) and below:
1. Except as otherwise indicated, maintain masonry temperature above 32 degrees F (0 degrees C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry, maintain heated enclosure to 40 degrees F (4 degrees C) for 48 hours.

PART 2 - PRODUCTS

2.1 FACING BRICK:

A. ASTM C 216, and as follows:
1. Manufacturer: Glen Gery Brick or approved equal.
2. Type FBS (normal size and color variations)
3. Standard Modular: 2-1/4" X 3-5/8" X 7-5/8"

B. Color:
   1. Modular Field Brick as selected from manufacturer's standard range.
   2. Modular Accent Brick courses as selected from manufacturer's standard range.

C. Provide special molded shapes where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.

D. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncored or unfrogged units with all exposed surfaces finished.

2.02 CONCRETE MASONRY UNITS:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

B. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

C. Non-Load Bearing Concrete Block: Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.

Hollow Load-Bearing Block: ASTM C 90 and as follows:

1. Weight Classification: Normal weight.

D. Architectural Split Face Units: ASTM C55, Type I, Grade N, with net area min average compressive strength of 3500 psi. Color as selected from manufacturer's standard range.

E. Architectural Ground Face Units: ASTM C55, Type I, Grade N, with net area min average compressive strength of 3500 psi. Color as selected from manufacturer's standard range.

F. Type: I.

G. Grade: N.

H. Size: Manufacturer's standard units with nominal face dimensions of 16" long X 8" high (15-5/8" X 7-5/8" actual) X thicknesses indicated.
   1. Cure units by autoclave treatment at a minimum temperature of 350 degrees F (176 degrees C) and a minimum pressure of 125 psi.

I. Hollow Load-Bearing Block: ASTM C 90 and as follows:

J. Weight Classification: Normal weight.

2.03 MORTAR AND GROUT MATERIALS:

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.

B. Masonry Cement: ASTM C 91.

C. For colored pigmented mortars use premixed colored masonry cements of formulation required to produce color indicated, or if not indicated. Mortar color to match existing; provide samples for approval by Architect.

D. Hydrated Lime: ASTM C 207, Type S.

E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

F. Aggregate for Grout: ASTM C 404.

G. Water: Clean and potable.

2.04 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

B. Zinc-Coated (galvanized) Steel Wire: ASTM A 82 for uncoated wire and with ASTM C 641 for zinc coating of class indicated below:

C. Horizontal Joint Reinforcing: Provide welded wire units prefabricated in straight lengths of not less than 10', with matching corner ("L") and intersecting ("T") units. Fabricate from cold-drawn steel wire complying with ASTM A 82, with deformed continuous side rods and plain cross rods, into units with widths of approximately 2" less than nominal width of walls and partitions as required to position side rods for full embedment in mortar with mortar coverage of not less than 5/8" on joint faces exposed to exterior and not less than 2" elsewhere. Provide the following type of joint reinforcing unless otherwise indicated.

D. Interior Single Wythe Walls: Provide truss type 9 gage side and cross rods, hot dip galvanized after fabrication; equal to "LADUR TYPE" by DUR-O-WAL. Provide units with adjustable 2-piece rectangular ties where horizontal joints of facing wythe do not align with those of back-up wythe equal to "DURO-O-EYE" by DUR-O-WAL.

E. Beams and Column Weld on Anchors: Beam ties with weld on anchors: Fabricate from 3/16" cold-drawn steel, wire, with 1.5 oz. hot dip coating ASTM A 153, Class B-2, of the length required for proper embedment in wythes of masonry.

F. Dovetail Slots: Furnish dovetail slots with filler strips, where shown. Fabricate from 24 gage galvanized steel unless otherwise indicated. Provide hot-dip galvanized steel dovetail anchors of the size and type to suit construction requirements.

G. Masonry Veneer Anchors: Two-piece assemblies which permit vertical or horizontal differential movement between wall and framework parallel to, but resist tension and compression forces perpendicular to, plane of wall; consisting of wire tie section and metal anchor section for attachment over sheathing to metal studs and complying with the following requirements:

1. Manufacture: Hohmann Barnard, Inc.
2. Product: Veneer Anchors 2-Seal Thermal Wing Nut
3. Thickness: 14Ga.
4. Pintle: Length 4”, 3/16” Dia.
5. Finish: Hot dipped Galvanized

2.05 CONCEALED FLASHING AND DAMPPROOFING MATERIALS:

A. Manufacturer: Henry Company
2911 Slauson Ave Huntington Park,
CA 90255
(800) 486-1278
www.henry.com

B. Products: Masonry Thruwall Flashing: Blueskin TWF

C. Cavity Wall Damproofing: AIR-BLOC 07,31 Vapor Permeable Air Barrier

D. Application/Installation: Follow all of manufacturers installation instructions.

2.06 MISCELLANEOUS MASONRY ACCESSORIES:

A. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

B. Weep – Manufacturer: Hoffman and Barnard
Product: QV-Quadro Vent 3/8" x 2 1/2" x 3-3/8" Color: Clear

C. Mortar Net-Manufacturer: Hoffman and Barnard
Product: Mortar Mitt

2.07 MORTAR AND GROUT MIXES:

A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellant agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

B. Do not use calcium chloride in mortar or grout.

C. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

D. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.

2.08 PROTECTIVE SEALANT:

A. General: Required at all Ground Face interior wall surfaces exposed to view in the following rooms: WOMEN 101 and MEN 104.

B. Product: Sure Klean Weather Seal Blok-Guard & Graffiti Control Ultra, as manufactured by PROSOCO, Inc., Lawence, KS, (800) 225-4255. E-mail: CustomerCare@prosoco.com

C. Application: Test a minimum 4 ft. by 4 ft. area on each type of masonry. Use the manufacturer's application instructions. Let test area protective treatment cure before inspection. Keep test panels available for comparison throughout the protective treatment project. Apply in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL:

A. Do not wet concrete masonry units.

B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

C. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.

D. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

E. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

F. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

G. Use dry cutting saws to cut concrete masonry units.

3.02 CONSTRUCTION TOLERANCES:

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1.4" in any story or 20' maximum, nor 1.2" in 40' or more. For vertical alignment of head joints, do not exceed plus or minus 1/4" in 10', 2" maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 2" in 40' or more. For top surface of bearing walls, do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 2" in any bay or 20' maximum, nor 3/4" in 40' or more.

D. Variation in Cross-Sectional Dimensions: For columns and thicknesses of walls, from dimensions shown, do not exceed minus 1/4" nor plus 2".

E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.03 LAYING MASONRY WALLS:

A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.

B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

C. Pattern Bond: Lay exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions

at corners or jambs.

D. Stopping and Resuming Work: Rack back 2-unit length in each course. Do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

E. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

G. Fill cores in hollow concrete masonry units with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

3.04 MORTAR BEDDING AND JOINTING:

A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under sells.

B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

D. Weather tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.

E. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.05 CAVITY WALLS:

A. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

B. Tie exterior wythe to back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.

C. Provide weep holes in exterior wythe of cavity wall located immediately above ledges and flashing, spaced 2'-0" o.c., unless otherwise indicated.

3.06 HORIZONTAL JOINT REINFORCEMENT:

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 2" elsewhere. Lap reinforcing a minimum of 6".

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.

D. Reinforce the following walls with continuous horizontal joint reinforcement:
1. Single-Wythe Walls
2. Hollow Concrete Masonry Walls
3. Multi-Wythe Masonry Walls

E. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

F. Space continuous horizontal reinforcement as follows:
1. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcement acts as structural bond or tie between wythes, space reinforcement as required by code but not more then 16" o.c. vertically.
2. For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.

G. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

H. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

3.07 ANCHORING MASONRY WORK:

A. General: Provide anchor devices of type indicated.

B. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

C. Provide an open space not less than 1" in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.

D. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

E. Space anchors as indicated, but not more than 24" o.c. vertically and 36" o.c. horizontally.

F. Anchor single wythe masonry veneer to metal studs with masonry veneer anchors to comply with the following requirements:

G. Embed tie section with masonry joints. Provide not less than 1" air space between back of masonry veneer wythe and face of sheathing.

H. Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.

I. Space anchors as indicated but not more than 16" o.c. vertically and 24" o.c. horizontally. Install

additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0".

3.08 LINTELS:

A. Install galvanized steel lintels where indicated.

B. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

3.09 FLASHING OF MASONRY WORK:

A. General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.

B. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.

C. Interlock end joints of deformed metal flashings by over-lapping deformations not less than 1-1/2" and seal lap with elastic sealant.

D. Install flashing to comply with manufacturer's instructions.

E. Provide weep holes in the head joints of the first course of masonry immediately above concealed flashings. Space 24" o.c., unless otherwise indicated.

F. Install reglets and nailers for flashing and other related work where shown to be built into masonry work.

3.10 FIELD QUALITY CONTROL:

A. Owner will employ separate testing laboratory to perform field quality control testing.

B. Contractor shall employ, at his own expense, a testing laboratory experienced in performing types of masonry field quality control tests for masonry indicated. Comply with requirements for qualification and acceptance of testing laboratory specified in Part 1 for pre-construction testing service.

3.11 REPAIR, POINTING AND CLEANING:

A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

D. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

E. Test cleaning methods on sample wall panel; leave 2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

F. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.

G. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

H. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

I. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION 04 20 00

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PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.2 DESCRIPTION OF WORK:

A. The work of this Section includes, but is not limited to the following:
1. Miscellaneous clips, plates, channels and angles.

B. This section includes all items made of iron or steel which are not included as part of Division 5 - Structural Steel, or other metal systems specified elsewhere and as specified herein.

1.3 RELATED WORK:

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections/Divisions that relate directly to work of this Section include, but are not limited to:
1. Division 3, Cast-In-Place Concrete.
2. Division 4, Concrete Unit Masonry

1.4 REFERENCES:

A. Except as shown or specified otherwise, the Work of this Section shall meet the requirements of the following:
1. Design, Fabrication, and Erection: "Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design" adopted by the American Institute of Steel Construction, June 1, 1989 (AISC Specification).
   a. Design and Fabrication of Cold-Formed Shapes: "Specification for the Design of Cold-Formed Steel Structural Members", by the American Iron and Steel Institute (AISI Specification).
2. Welding: "Structural Welding Code - Steel, AWS D1.1", or "Structural Welding Code - Sheet Steel, AWS D1.3", by the American Welding Society (AWS Codes).

1.5 SUBMITTALS:

A. Shop Drawings: Show application to project. Furnish setting drawings and templates for installation of bolts and anchors in other Work. Indicate shop and field welds by standard AWS welding symbols in accordance with AWS A2.4.

B. Product Data: Catalog sheets, specifications, and installation instructions for each fabricated item specified, except submit data for fasteners only when directed.

1.6 QUALITY ASSURANCE:

A. Galvanizing: Stamp galvanized items with galvanizer's name, weight of coating, and applicable ASTM number.

B. Shop fabricate work to the greatest extent possible. Clearly label pieces in shop to facilitate field assembly.

C. Perform welding in compliance with American Welding Society Code. Shop weld and grind connections to the greatest extend possible.

D. Field Measurements: Take accurate field measurements before preparation of shop drawings and fabrication. Do not delay job progress; allow for field cutting and fitting where taking field measurements

before fabrication is not possible. Do not field cut or fit items which have been hot-dip galvanized after fabrication.

E. Calculations: Provide professionally prepared calculations and certification of the performance of this work. Show how design load requirements and other performance criteria have been satisfied.

1.7 DELIVERY AND STORAGE:

A. Coordinate delivery of items to be built into other construction to avoid delay.

B. Promptly cover and protect steel items delivered to the Site.

1.8 PROJECT CONDITIONS:

A. Do not permit use of stairs, ladders, handrails, guardrails or other work until work is completely and fully installed and ready to assume its intended design loads. Do not permit overloading of any miscellaneous metal system. Do not permit use of concrete filled metal pan stair systems before concrete is placed and cured.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Steel Shapes, Plates, and Bars: ASTM A 36.

B. Steel Plates to be Bent or Cold-Formed: ASTM A 283, Grade C.

C. Steel Bars and Bar-Size Shapes: ASTM A 675, Grade 70; or ASTM A 36.

D. Merchant Quality Steel Bars: ASTM A 575, grade as selected by fabricator.

E. Cold-Finished Steel Bars: ASTM A 108, grade as selected by fabricator.

F. Hot-Rolled Carbon Steel Sheet and Strip: ASTM A 569, pickled and oiled.

G. Cold-Rolled Carbon Steel Sheet: ASTM A 366, oiled.

H. Galvanized Steel Sheet: ASTM A 526, with G90 hot-dip process zinc coating complying with ASTM A 525.

I. Steel Tubing: Hot-formed, welded or seamless, structural tubing; ASTM A 501.

J. Cold-Drawn Steel Tubing: ASTM A 512, buttwelded, cold-finished carbon steel tubing, sink drawn and stress relieved.

K. Cast Iron Castings: ASTM A 48, gray iron castings, Class 30.

L. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.

M. Steel Castings: ASTM A 27, grade and class as required by use of item.

N. Steel Pipe: ASTM A 53, type as selected, Grade A; black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise shown or specified.

O. Rolled Steel Floor Plate, Raised Pattern: FS QQ-F-461, Class 1, ASTM A 36 steel; raised herringbone pattern unless otherwise indicated.

P. Stainless Steel: Type 302/304; ASTM A 666 for plate, sheet and strip; ASTM A 276 for bars and shapes; ASTM A 269 for tubing.

Q. Fasteners: Galvanize fasteners for exterior use or for anchorage of metal Work to exterior walls. If not indicated, use type, size, style, grade, and class as required for secure installation of metal fabrications. Except when shown, specified, or approved otherwise, furnish fasteners selected from the following:

1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
2. Lag Bolts: FS FF-B-561, square head.
3. Machine Bolts: FS FF-B-584 heads; FS FF-N-836 nuts.
4. Machine Screws: FS FF-S-92, cadmium plated steel.
5. Wood Screws: FS FF-S-111, flat countersunk head, carbon steel.
6. Plain Washers: FS FF-W-92, round, general assembly grade, carbon steel.
7. Lock Washers: FS FF-W-84, helical spring type, carbon steel.
8. Toggle Bolts: Tumble-wing type; FS FF-B-588, type, class and style as required to sustain load.
9. Stainless Steel Fasteners: ASTM A 666; Type 302/304 for interior Work; Type 316 for exterior Work; Phillips flathead (countersunk) screws and bolts for exposed Work.

R. Anchors:
1. Concrete Inserts: Galvanized ferrous castings, ASTM A 47 or ASTM A 27; or galvanized pressed steel plate, ASTM A 283; type required for anchorage indicated.
2. Externally Threaded Expansion Bolt Anchors: FS FF-S-325, Group II, Type 4, Class 1.
3. Internally Threaded Expansion Shield Anchors (For Lag Bolts): FS FF-S-325, Group II, Type 1.
4. Internally Threaded Expansion Shield Anchors (For Machine Bolts): FS FF-S-325, Group II, Type 2.

S. Shop Paint (General): Steel primer selected from the following:
1. TNEMEC 10-99 (Red), 10-99G (Green) or 10-1009 (Gray).
2. Rust-Oleum 769.
3. Valspar 13-R-53.
4. Sherwin-Williams "Kromik".

T. Shop Paint for Galvanized Steel: FS TT-P-641, Type II.

U. Cold Galvanizing Compound: Single component compound giving 93 percent pure zinc in the dried film, and meeting the requirements of DOD-P-21035A (NAVY).

V. Bituminous Mastic: Cold applied asphalt mastic; SSPC - Paint 12.

W. Bedding Mortar:
1. Cement Grout: One part Portland cement complying with ASTM C150, Type I or III, to 3 parts natural sand complying with ASTM C404, size No.2 mixed with minimum amount of water required for placement and hydration. Ratio by volume.

2. 2 MISCELLANEOUS FRAMING AND SUPPORTS:

A. Fabricate metal framing and supports to support related items required by the Work. Fabricate of welded construction unless otherwise indicated. Preassemble to largest extent possible.

B. When required to be built into other Work, equip units with integral anchors spaced not more than 24 inches on center.

C. Galvanize exterior steel framing and supports.

2.3 MISCELLANEOUS STEEL TRIM:

A. Fabricate trim of shapes, sizes, and profiles shown, with continuously welded joints and smooth exposed edges, unless otherwise indicated or approved. Use concealed field splices wherever possible. Furnish necessary cutouts, fittings, and anchorages.

B. Galvanize exterior steel trim.

2.4 FABRICATION:

A. Use materials of size and thickness indicated. If not indicated, use material of required size and thickness to produce adequate strength and durability for the intended use of the finished product. Furnish suitable, compatible anchors and fasteners to support assembly.

B. Fabricate items to be exposed to view of material entirely free of surface blemish, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove surface blemishes by grinding or by welding and grinding prior to cleaning, treating, and finishing. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown.

C. Joints: Fabricate accurately for close fit. Weld exposed joints continuously unless otherwise indicated or approved. Dress exposed welds flush and smooth.

D. Connections: Form exposed connections with flush, smooth, hairline joints. Use concealed fasteners wherever possible. Use Phillips flathead (countersunk) bolts or screws for exposed fasteners, unless otherwise shown or specified.
1. Furnish flat washer under connections requiring raised bolt heads.
2. Furnish lock washer under nuts when through-bolting occurs.

E. Punch, reinforce, drill, and tap metal Work as required to receive hardware and other appurtenant items.

F. Galvanizing:
1. In addition to specific items specified or noted to be galvanized, galvanize items attached to, embedded in, or supporting exterior masonry (including interior wythe of exterior masonry walls) and concrete Work.
2. Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:
    a. ASTM A 123 for plain and fabricated material, and assembled products.
    b. ASTM A 153 for iron and steel hardware.

G. Shop Painting:
1. Cleaning Steel: Thoroughly clean all steel surfaces. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning". Remove loose mill scale, loose rust, weld slag and spatter, and other detrimental material in accordance with SSPC SP-2 "Hand Tool Cleaning", SSPC SP-3 "Power Tool Cleaning", or SSPC SP-7 "Brush-Off Blast Cleaning".
2. Galvanized Items:
    a. Galvanized items which are to be finish painted under Section 09900 shall be rinsed in hot alkali or in an acid solution and then in clear water.
    b. Welded and abraded areas of galvanized surfaces shall be wire brushed and repaired with a coating of cold galvanizing compound.
3. Apply one coat of shop paint to all steel surfaces except as follows:
    a. Do not shop paint steel surfaces to be field welded and steel to be encased in cast-in-place concrete.
    b. Apply 2 coats of shop paint, before assembly, to steel surfaces inaccessible after assembly or erection, except surfaces in contact.
    c. Do not paint galvanized items which are not to be finished painted under Section 09900.
4. Apply paint and compound on dry surfaces in accordance with the manufacturer's printed instructions, and to the following minimum thickness per coat:
    a. Shop Paint (General): 4.0 mils wet film.
    b. Shop Paint for Galvanized Steel: 3.0 mils wet film.
    c. Cold Galvanizing Compound: 2.0 mils dry film.

H. Primer for Non-Galvanized Ferrous Surfaces (except interior handrail and railing assemblies and interior steel stairs): Provide high quality, lead-free, rust inhivitive primer, equal to one of the following:
1. Series 10 Metal Primer, Tnemec.
2. Bar-ox Quick Dry Universal Primer; Devoe and Raynolds.
3. Ironclad Retardo; Benjamin Moore.

I. Shop Primer for Galvanized Fabrications: Exterior galvanized handrails, ladders, exhaust lintels, shelf angles, pipe bollards, and other items as indicated or directed by Architect to be painted, shall be

primed with one of the following shop primers within 12 hours of the galvanizing process. Provide one coat of the following at 3.0 to 4.0 mils DFT for galvanized items indicated to be painted:

1. No. 69 Hi-Build Epoxoline; Tnemec.
2. International Protective Coatings equal.
3. Valspar equal.

J. Bituminous-based paint for electrolytic isolation shall be cold applied black asphaltic mastic conforming to SSPC Paint 12, with no asbestos fibers.

PART 3 EXECUTION

3.1 PREPARATION:

A. Temporarily brace and secure items which are to be built into concrete, masonry, or similar construction.

B. Isolate non-ferrous metal surfaces to be permanently fastened in contact with ferrous metal surfaces, concrete, or masonry by coating non-ferrous metal surface with bituminous mastic, prior to installation.

3.2 INSTALLATION:

A. Fit and set fabricated metal Work accurately in location, alignment, and elevation, level, plumb, true and fee of rack, measured from established lines and levels. Securely fasten in place. Cut off exposed threaded portion of bolts flush with nut.

B. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar or grout.

C. Attached Work: Fasten to concrete and solid masonry with expansion anchors and to hollow masonry with toggle bolts in cells, unless otherwise indicated. Drill holes for fasteners to exact required size using power tools.

D. Install anchorage devices and fasteners where necessary for securing metal stair items to in-place construction.

3.3 TOLERANCES:

A. The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work.

1. Allowable variation from true, plumb, level and line: ± 1/8" in 20'-0".

3.4 REPAIRING, CLEANING AND PROTECTION:

A. Touch up damaged coatings and finishes to eliminate evidence of repair.

B. Repair minor damage to eliminate all evidence or repair. Remove and replace work which cannot be satisfactorily repaired.

END OF SECTION 05 50 00

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PART 1 – GENERAL

1.1 REFERENCES

A. Standards: Comply with the following unless otherwise specified or indicated on the Drawings:
   1. Lumber: American Softwood Lumber Standard PS 20 by the U.S. Department of Commerce. Comply with applicable provisions for each indicated use.
   2. Plywood: Product Standard PS 1 for Softwood Plywood, Construction and Industrial by the U.S. Department of Commerce.
   3. Plywood Installation: APA Design/Construction Guide, Residential & Commercial by the American Plywood Association (APA).
   4. Grading Rules:
      a. Douglas Fir, Hem-Fir, Idaho White Pine, and other Western Woods: Western Wood Products Association (WWPA) or West Coast Lumber Inspection Bureau (WCLIB).
      b. Southern Pine: Southern Pine Inspection Bureau (SPIB).
      c. Redwood: Redwood Inspection Service (RIS).
      d. Spruce-Pine-Fir: National Lumber Grades Authority (NLGA).
   5. User Specification for Treated Wood, American Wood Protection Association Standard (AWPA) U1-02.
   6. Framing Installation: American Forest and Paper Association (AFPA).
   7. ICC Evaluation Service, Inc.; ESR-1721.

1.2 SUBMITTALS

A. Quality Control Submittals:
   1. Certificates: Certification for the following wood treatments:
      a. Pressure Treatment: Certification by treating plant stating chemicals and process used, net amount of chemical preservative retained, and conformance with specified standards.
      b. Waterbourne Preservatives: Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
      c. Fire-Retardant Treatment: Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes.

1.3 QUALITY ASSURANCE

A. Mill and Producers Mark: Each piece of lumber and plywood shall be gradestamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.
   1. Pressure Preservative Treated Material: Accredited agency quality mark on each piece of wood indicating treatment.
   2. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Keep materials dry during delivery. Store materials 6 inches minimum height above ground surface. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation between stacks.

B. Cover stored materials until ready for use for protection from moisture. Place and anchor cover in a manner that will provide good ventilation under the covering.

1.5 PROJECT CONDITIONS

A. Correlate location of supporting members to allow proper attachment of other Work.

PART 2 PRODUCTS

2.1 LUMBER

A. Framing Lumber: Species: Douglas Fir or Hem-Fir (WWPA or WCLIB), Southern Pine (SPIB), Redwood (RIS), or Spruce-Pine-Fir (NLGA) unless otherwise indicated.
   1. Light Framing; 2 inches through 4 inches thick, less than 6 inches wide:
      a. Standard and Better grade.
      b. Standard grade.
      c. Utility grade.

B. Board Lumber; less than 2 inches thick:
   1. Exposed Board Lumber, for Paint Finish: Southern Pine No. 1 (SPIB), Douglas Fir 2 Common (WWPA) or Select Merchantable (WCLIB), Redwood Construction Common (RIS), or Spruce-Pine-Fir No. 1 / No. 2 (NLGA).
   2. Concealed Board Lumber: Southern Pine No. 3 (SPIB), any species No. 4 (WWPA) or any species Standard (WCLIB), Redwood Merchantable (RIS), or Spruce-Pine-Fir No. 1 / No. 2 (NLGA).

C. Miscellaneous Lumber: Standard grade, No. 3 grade, or better grade of the following species unless otherwise indicated:
   1. Nailers and Blocking: Douglas Fir, Hem-Fir, Idaho White Pine, Southern Pine, or Spruce-Pine-Fir.
   2. Furring: Douglas Fir, Southern Pine, or Spruce-Pine-Fir.
   3. Plaster Grounds:
      a. Interior Use: Douglas Fir, Southern Pine, or Spruce-Pine-Fir.

2.2 PLYWOOD

A. Sheathing and Subflooring: APA RATED SHEATHING, EXPOSURE 1. Furnish APA PS 1 veneered panels, with span ratings for the required thicknesses as listed below unless otherwise indicated.

THICKNESS	SPAN RATING
3/8 inch	24/0
1/2 inch	32/16
5/8 inch	40/20
3/4 inch	48/24

2.3 PRESERVATIVE TREATMENT

A. Treat lumber and plywood where indicated and as specified. Comply with applicable AWPA U1 Standards and quality control and inspection requirements.
   1. Fasteners and anchoring devices to be used with wood treated with waterbourne preservatives shall be hot-dipped galvanized or stainless steel if the wood will be exposed to moisture.

B. Complete fabrication of items to be treated to the greatest extent possible prior to treatment. Where items must be cut after treatment, coat cut surfaces with heavy brush coat of the same chemical used for treatment or other solution recommended by AWPA Standards for the treatment.

C. Inspect wood after treating and drying. Discard warped or twisted items.

D. Wood Treatment: Compatible with galvanized metal connector plates, unless other compatible protective finish for connector plates is approved by the Director for use with approved treatment.

E. Wood Treatment: Compatible with galvanized metal connector plates, unless other compatible protective finish for connector plates is approved by the Director for use with approved treatment.

2.4 FIRE-RETARDANT TREATMENT

A. Furnish "FR-S" lumber where indicated, complying with AWPA U1 Standards for pressure impregnation with fire-retardant chemicals to achieve a flamespread rating of 25 or less, when tested in accordance with UL Test 723, ASTM E 84 or NFPA Test 255.
   1. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment which will not bleed through or adversely affect bond of finish.
   2. Provide UL label or identifying mark on each piece of fire-retardant lumber.
   3. Redry treated items to a maximum moisture content of 19 percent after treatment.

2.5 FRAMING HARDWARE

A. Fasteners and Anchoring Devices: Select and furnish items of type, size, style, grade, and class as required for secure installation of the Work. Items shall be Hot Dip galvanized or stainless steel for exterior use. Items exposed to treated wood shall be Hot-Dip galvanized conforming to ASTM Standard A653; Class G-185 or AISI 304 or AISI 316 stainless steel. Unless shown or specified otherwise, comply with the following:
   1. Nails, Screws, Lag Screws/Lag Bolts, Bolts/Nuts/Washers:
      a. Hot-Dip galvanized, ASTM Standard A653; Class G-185.
      b. Stainless steel AISI 304 or AISI 316.
      c. Zinc or cadmium plated.
      d. Silicon bronze.
   2. Expansion Anchors: Hot-Dip galvanized steel wedge anchors, ASTM Standard A653; Class G-185.
   3. Toggle Bolts: Cadmium or zinc plated tumble - wing type.
   4. Self Threading Masonry Screws: Zinc Plated; "Tapcon" by Elco Industries, Inc., 1111 Samuelson Rd., PO Box 7009, Rockford, IL 61125-7009, (815) 397-5151.
   5. Bar or Strap Anchors: ASTM A575 carbon steel bars.
   6. Wall Plugs: Corrugated type, galvanized steel, 24 USS gage min, not less than 2 inches wide x 2-1/2 inches deep.
   7. Cross Bridging: Nailable type, galvanized steel, 16 USS gage min, by 3/4 inch wide.
   8. Metal Hangers and Framing Anchors: Size and type for intended use, galvanized finish, manufacturer's recommended fasteners. Items exposed to treated wood shall be Hot-Dip galvanized conforming to ASTM Standard A653; Class G-185 and epoxy coated in the field.
   9. Buck Anchors: Corrugated type, galvanized steel not lighter than 12 USS gage min, 4 inches wide (except where partitions are less than 4 inches thick) by 8 inches long, punched for two 5/16 inch carriage bolts at buck end.
   10. Sleeper Anchors: Approved type, galvanized steel not lighter than 20 USS gage min, not less than 1-1/4 inches wide, designed to anchor into concrete not less than 1-1/2 inches and permit height adjustment of sleeper.
   11. Stainless Steel Anchors: AISI 304 or AISI 316; Applications include permanent wood foundations and corrosive environments such as saltwater spray and preservative treated wood.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine substrate and supporting structure on which rough carpentry is to be installed for defects that will adversely affect the execution and quality of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION - GENERAL

A. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or with optimum joint arrangement.

B. Install Work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction.

C. Securely attach carpentry Work to substrates by anchoring and fastening as indicated or, if not indicated, as required by the referenced standards. Select fasteners of size that will not penetrate through members where opposite side will be exposed to view or will receive finish materials. Make

tight connections between members. Install fasteners without splitting wood; predrill as required. Set nail heads in exposed Work which is to be painted or stained and fill resulting holes.

D. Treated Wood: Apply heavy brush coat of treatment material to field cut surfaces.

3.3 WOOD FRAMING

A. Install framing members of nominal sizes indicated or of units built-up to dimensions indicated, on spacings shown. Unless otherwise indicated, comply with the recommendations of the AFPA "Manual for Wood Frame Construction". Construct required openings for installation of related work. Do not splice structural members between supports.

B. Anchor and nail members as indicated. If not indicated, comply with the "Recommended Nailing Schedule - Table 1" of the "Manual for Wood Frame Construction" and other applicable recommendations of the AFPA.

C. Install miscellaneous blocking and framing indicated and as required for attachment and support of facing materials, fixtures, specialty items, and trim.

3.4 WOOD NAILERS, BLOCKING, AND GROUNDS

A. Install required items where indicated and where required for support, attachment or screeding of other Work. Form to shapes indicated or required. Coordinate locations and cut and shim as required to provide items at true and level planes to receive Work to be attached. Install closure strips for nailers at all edges.

1. Attach to substrates as indicated; if not indicated, size and space fasteners as required to support applied loading. Maximum spacing of fasteners shall not exceed 16 inches. Unless otherwise shown on the Drawings, install and secure material to non-wood construction as follows:
    a. To Concrete: Attach material less than 1-1/2 inches thick with screws and non-ferrous metal expansion shields. Attach material 1-1/2 inches and thicker with machine bolts and non-ferrous metal compound type anchors.
    b. To Concrete Unit Masonry: Attach material to new masonry with annular ring nails driven into wall plugs where fastening occurs at joints of masonry or with special hardened steel masonry nails where fastening occurs in the masonry units. Attach material to existing masonry with machine screws and non-ferrous metal expansion shields where fastening occurs in solid portions of masonry. If fastening occurs at cells of masonry, secure material in place with toggle bolts.
    c. To Brick Masonry: Attach material to new masonry with annular ring nails driven into wall plugs. Attach material to existing masonry with machine screws and non-ferrous metal expansion shields.
    d. To Steel: Attach material with galvanized bolts and nuts or stainless steel machine screws tapped into the metal, as required by conditions.
    e. To Non-Ferrous Metal: Attach material with stainless steel or other approved non-ferrous metal bolts and nuts or self-tapping screws, as required by conditions.
2. Counter-sink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry Work. Where possible, anchor to formwork before concrete placement. Bevel both edges of members to be anchored in concrete. Shims shall be cedar shingles or redwood wedges.
3. Install permanent grounds of dressed, preservative treated, key- beveled lumber not less than 1-1/2 inches wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.5 PLYWOOD SHEATHING, SUBFLOORING, AND UNDERLAYMENT

A. Comply with printed installation requirements of the APA Design/ Construction Guide, Residential & Commercial for plywood application required, unless otherwise indicated.

B. Plywood Underlayment: Install underlayment just prior to installation of finish flooring. Stagger end joints between panels in relation to each other and stagger all joints in relation to substrate jointing. Allow 1/32 inch space between panel ends and edges for expansion. Fasten in accordance with APA recommendations. Prior to installation of finish flooring, patch damaged areas wider than 1/16 inch. Set nails 1/16 inch, but do not fill. Sand rough areas smooth and uneven joints flush.

3.6 WOOD FURRING

A. Install members plumb and level with closure strips at all edges. Shim with wood as required to achieve tolerance specified.
   1. Fastening: Attach to substrates as indicated; if not indicated, attach material as specified for nailers and blocking.
   2. Tolerance: Shim and level wood furring to a tolerance of 1/8 inch in 10 feet.
   3. Firestop furred spaces on walls at each floor level, with wood blocking or other approved non-combustible materials. Fit members accurately to close furred spaces.
   4. Furring to Receive Plywood Paneling: Unless otherwise indicated, 1 x 3 inch furring at 2 feet oc, horizontally and vertically.
   5. Furring to Receive Gypsum Drywall: Unless otherwise indicated, 1 x 2 inch furring at 16 inches oc, vertically.
   6. Furring to Receive Plaster Lath: Unless otherwise indicated, 1 x 2 inch furring at 16 inches oc, vertically.
   7. Suspended Furring: Size and spacing indicated, including hangers and attachment devices.

END OF SECTION 06 10 00

U1-09 *USE CATEGORY SYSTEM: USER SPECIFICATION FOR TREATED WOOD 2009*

TABLE 2-1: PRESERVATIVE TREATMENT SERVICE CONDITIONS FOR USE CATEGORY DESIGNATIONS

USE CATEGORY	SERVICE CONDITIONS	USE ENVIRONMENT	COMMON AGENTS OF DETERIORATION	TYPICAL APPLICATIONS
UC3A ABOVE GROUND Protected	Exterior construction Above Ground Coated & rapid water runoff	Exposed to all weather cycles, not Exposed to prolonged wetting	Decay fungi and insects	Coated millwork, siding and trim
UC3B ABOVE GROUND Exposed	Exterior construction Above Ground Uncoated or poor water runoff	Exposed to all weather cycles Including prolonged wetting	Decay fungi and insects	Decking, deck joists, railings, fence pickets, uncoated millwork
UC4A GROUND CONTACT General Use	Ground Contact or Fresh Water Non-critical Components	Exposed to all weather cycles, normal exposure conditions	Decay fungi and insects	Fence deck and guardrail posts, crossties & utility poles (low decay areas)
UC4B GROUND CONTACT Heavy Duty	Ground Contact or Fresh Water Critical components or difficult replacement	Exposed to all weather cycles, high decay potential includes salt water splash	Decay fungi and insects with increased potential for biodeterioration	Permanent wood foundations, building poles, horticultural posts, crossties & utility poles (high decay areas)
UC4C GROUND CONTACT Extreme Duty	Ground Contact or Fresh Water Critical structural components	Exposed to all weather cycles, severe environments extreme decay potential	Decay fungi and insects with extreme potential for biodeterioration	Land & Freshwater piling, foundation poles, crossties & utility poles (severe decay areas)

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PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. Rough Carpentry: Section 061000.

1.2 REFERENCES:

A. Comply with the applicable provisions of the "Architectural Woodwork Standards" (First Edition-2009) (AWS) except as otherwise specified herein. References to "Premium", "Custom", and "Economy" Grades herein, shall be as defined in that Standard.

B. Lumber Standard: AWS Section 3.

1.3 SUBMITTALS:

A. Shop Drawings: Show fabrication details and connections to adjacent Work.

B. Product Data: Manufacturers' catalog sheets, specifications, and installation instructions for plastic laminates and hardware items.

C. Samples:
1. Plastic Laminate: 12 inch square section, each type.
   a. Color Samples: Manufacturer's standard colors, textures, and finish.
2. Transparent Finish Samples: 12 inches long x full width, 6 inch width for panels; each type wood species and item to receive finish.

PART 2 - PRODUCTS

2.1 CABINETS AND COUNTERTOPS:

A. Comply with AWS Sections 10 and 11 except as otherwise specified herein.

B. Closure Panel: Plastic Laminate.
1. For Laminate Finish: Custom Grade, with plastic laminate cover on exposed cabinetwork and on inside face of hinged doors.

C. Countertops:
1. Corian: Solid surface – color to be selected from manufacturer’s standard range.

2.2 FABRICATION:

A. Machine and sand wood surfaces to comply with the requirements of the AWS Quality Grade specified.

B. Mill assemble items to largest sizes practicable, to minimize field cutting and jointing. Allow for cutting and fitting where necessary to fit at the Site.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install the Work of this Section in strict accordance with the manufacturer's printed instructions and approved shop drawings (if any).

B. Fit joints neatly and accurately with adjoining surfaces in same plane. Maintain field joint tolerances equal to those specified in AWS Standards.

C. Fastening:
   1. Use concealed fasteners for work to receive transparent finish.
   2. Fasten assembled items together securely.
   3. Fasten items securely to supporting surfaces.
   4. Set exposed nails for putty stopping.
   5. Plug stop screws in exposed-to-view surfaces.
   6. Perform gluing operations in such a manner that the glued surfaces will be in close contact throughout, firmly cemented together and with joints as nearly invisible as possible.

D. Trim and Molding: Install in single, unjointed lengths at openings and for runs less than the maximum lumber length available. For long runs, use only 1 piece less than the maximum length available in any straight run. Stagger joints in adjacent members. Cope molding at returns. Miter at corners.

3.2 CLEANING:

A. Clean exposed surfaces of prefinished Work.

3.3 PROTECTION:

A. Protect installed Work from damage by Work of other trades. Maintain temperature and humidity requirements during the construction period in interior installation areas.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. 04 20 00 Unit Masonry.

1.2 DESCRIPTION OF WORK:

A. The work of this section includes the following:
   1. Thermal batt insulation in ceiling/deck assembly.
   2. Thermal batt insulation in wall cavities.

B. Acoustic batt insulation in wall cavities is specified in 09 21 16 Gypsum Board Assemblies.

1.3 SUBMITTALS:

A. Product Data: Catalog sheets, specifications, and installation instructions for each type of insulation specified.
   1. Include data substantiating that the materials comply with the specified thermal resistance and vapor resistance qualities.

1.4 QUALITY ASSURANCE:

A. Allowable Thickness Variations: Manufacturer's standard units which vary slightly from the thickness indicated may be acceptable, subject to the approval of the Architect.

B. Thermal Resistance: The thicknesses shown are for the thermal resistance (R-Value in accordance with ASTM C 177 or ASTM C 518) specified for each material. The R-Values specified are minimum acceptable. Provide adjusted thicknesses as directed for the use of material having a different thermal resistance.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Do not allow insulation materials to become wet or soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

B. Protect insulation materials subject to deterioration by sunlight from exposure to sunlight.

C. Complete the installation and concealment of insulation materials as rapidly as possible.

1.6 PROJECT CONDITIONS:

A. Do not proceed with the installation of insulation on walls or under slabs until the Work which follows (and which conceals the insulation) is ready to be performed.

B. Examination of Substrate: Examine the substrate and the conditions under which the insulation Work is to be performed. Do not proceed with the insulation Work until unsatisfactory conditions have been corrected.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Mineral Wool Insulation / Cavity Wall Continuous Insulation: Non-combustible, semi-rigid mineral wool insulation board that is water repellant and resists temperatures above 2,000d F; meets ASTM C 612, IVA.
   1. Product: Thermafiber RainBarrier HD:
      a. R-value of 4.3 per inch.

b. Facing: Unfaced
c. Density: 6.0 pcf.
d. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0
e. Moisture Resistance: Absorbs less than 0.03% by volume, ASTM C 1104.
f. Non-corrosive, ASTM C 665.
g. Recycled Content:
Pre-consumer recycled content:
Standard Mineral Wool Products……70%
Post-consumer recycled content……0%

B. Blanket Type Building Insulation: Glass fibers and resinous binders formed into flexible blankets; meets ASTM 665, ASTM E136
1. Manufacturer: Owens Corning.
2. Product: Ecotouch Pink Fiberglass
3. R-value: As noted on the Drawings
4. Facing: Unfaced.

C. Mechanical Anchors: Type and size shown or, if not shown, as recommended by the insulation manufacturer for the type of application shown and condition of substrate.

D. Vapor Barrier: Polyethylene sheeting; ASTM D 4397; 6 mils minimum thickness, 3.7 g/m2 per 24 hr maximum water vapor transmission rate.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Verify that adjacent materials are dry and ready to receive insulation.

3.2 INSTALLATION:

A. Comply with manufacturer's printed instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

B. Extend insulation full thickness over entire surface to be insulated. Apply a single layer of insulation of the required thickness, unless otherwise indicated or required to make up the total thickness. Cut and fit tightly around obstructions, and fill voids with insulation.
1. Do not place insulation over, or within 3 inches of recessed lighting fixtures.

C. Install insulation with factory applied barrier membrane facing the warm side of building spaces. Tape ruptures in barrier membrane.
1. Install reflective barrier membrane insulation with 3/4 inch air space in front of reflective barrier membrane wherever possible.

D. Install separate polyethylene sheeting vapor barrier where shown, in accordance with manufacturer's printed instructions. Lap all seams and joints a minimum of 6 inches.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. Cast-In-Place Concrete: Section 033000.

1.2 REFERENCES

A. ASTM D 882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting.

B. ASTM D 1709 Standard Test Methods of Impact Resistance of Plastic Film by the Free-Falling Dart Method.

C. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.

D. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.

E. ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

F. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil Or Granular Fill Under Concrete Slabs.

1.3 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each material specified.

B. Samples:
   1. Vapor Retarder Material: 12 inches square.
   2. Pressure-Sensitive Tape: 36 inch long piece minimum.

PART 2 PRODUCTS

2.1 COMPANIES

A. Fortifiber Building Systems Group, 419 West Plumb Lane, Reno, NV 89509-3766, 800-773-4777, www.fortifiber.com.

B. Raven Industries Inc., PO Box 5107, Sioux Falls, SD 57117-5107, (605) 336-2750, www.ravenind.com.

C. Stego Industries LLC, 232 Avenida Fabricante #103, San Clemente, CA 92672-7553, (877) 464-7834, www.stegoindustries.com.

D. W. R. Meadows, Inc., PO Box 338, Hampshire, IL 60140-0338, (800) 342-5976, www.wrmeadows.com.

2.2 MATERIALS

A. Vapor Retarder: Extruded single-ply or multi-ply type; polyethylene or polyolefin.
   1. Water-Vapor Permeance (ASTM E 96 or ASTM E 154): 0.04 perms or less.
   2. Class Rating (ASTM E 1745): A.
   3. Tensile Strength (ASTM E 154 or ASTM D 882): 45 lbf./in. or higher.
   4. Puncture resistance (ASTM D 1709): 2200 g or higher.
   5. Thickness: 10 mils minimum.
   6. Acceptable Products:
      a. “Moistop Ultra 10” by Fortifiber Building Systems Group.
      b. “Vapor Block 10” by Raven Industries, Inc.
      c. “Stego Wrap 10-Mil Vapor Barrier” by Stego Industries, LLC.
      d. “Perminator 10 Mil Underslab Vapor-Mat” by W. R. Meadows, Inc..

B. Pressure-Sensitive Tape/Adhesive: Vapor retarder manufacturer’s standard or recommended materials.

C. Pipe Boots: Vapor retarder manufacturer's standard pipe boots, or construct pipe boots from vapor retarder material, pressure-sensitive tape and/or adhesive, in accordance with vapor retarder manufacturer's instructions

PART 3 EXECUTION

3.1 PREPARATION

A. Surface Preparation: Rake, trim, and tamp surfaces over which vapor retarder is to be installed to true planes and as required to make a surface that will not puncture the vapor retarder material.

3.2 INSTALLATION

A. Install vapor retarder in accordance with manufacturer's printed instructions and ASTM E 1643. Lap seams and joints a minimum of 6 inches and seal with adhesive or pressure-sensitive tape.

B. Lap vapor retarder over footings and seal to foundation walls.

C. Seal penetrations, including pipes, with pipe boots.

3.3 PROTECTION

A. Protect vapor retarder as required so that it will be in sound condition, free from punctures and tears, at the time the concrete is placed.

3.4.1 REPAIR

A. Repair tears and punctures with a piece of vapor retarder material, overlapping the tear or puncture a minimum of six inches on all sides, and completely seal edges with pressure-sensitive tape or adhesive.

END OF SECTION 07 26 0

PART 1 – GENERAL

1.1 SECTION INCLUDES:

A. Double lock standing seam, single element, metal roof panels.

B. Accessories including concealed anchor clips, fasteners, perimeter flashing, trim and penetration treatments.

C. ASTM International

1.2 REFERENCES:

A. ASTM International
1. ASTM A240; Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
2. ASTM A653; Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A666; Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
4. ASTM A792 – Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
5. ASTM B117; Standard Practice for Operating Salt Spray(Fog) Apparatus.
6. ASTM B209; Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
7. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
8. ASTM D522; Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
9. ASTM D523; Standard Test Method for Specular Gloss.
10. ASTM D714; Standard Test Method for Evaluating Degree of Blistering of Paints.
11. ASTM D968; Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
12. ASTM D1308; Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
13. ASTM D2244; Standard practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
14. ASTM D2247; Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
15. ASTM D2794; Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
16. ASTM D3359; Standard Test Methods for Measuring Adhesion by Tape Test.
17. ASTM D3363; Standard Test Method for Film Hardness by Pencil Test.
18. ASTM D4145; Standard Test Method for Coating Flexibility of Prepainted Sheet.
19. ASTM D4214; Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
20. ASTM D5894; Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
21. ASTM E283; Standard Test Method for determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors under Specified Pressure Differences across the Specimen.
22. ASTM E331; Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
23. ASTM E1592; Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
24. ASTM G153; Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.
25. ASTM G154; Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.

B. Connecticut State Building Code – current edition, product approvals.

C. Underwriters Laboratories (UL)
1. UL 580; Tests for Uplift Resistance of Roof Assemblies

D. Factory Mutual (FM)
1. FM 4471; Approval Standard for Class 1 Panel Roofs

1.3 SUBMITTALS:

A. Refer to Section 01 33 23 Shop Drawings, Product Data and Samples.

B. Product Data: Submit manufacturer current technical literature for each type of product.

C. Shop Drawings - Submit detailed drawings showing:
1. Profile
2. Gauge of panel
3. Location, layout and dimensions of panels
4. Location and type of fasteners
5. Shape and method of attachment of all trim
6. Locations and type of sealants
7. Installation sequence.
8. Other details as may be required for a weathertight installation

D. Samples: Provide nominal 3 x 5 inch of each color indicated. Provide panel width by 10 inches long minimum.

E. Quality Assurance Submittals
1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
2. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

F. Closeout Submittals
1. Refer to Section 01 77 00 Closeout Procedures.

1.4 ADMINISTRATIVE REQUIREMENTS:

A. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to roof panel system, installation of any separate air/water barriers, treatment of fenestration, and other requirements specific to the project.

1.5 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Manufacturer shall have a minimum of ten (10) years experience in the production of metal roof panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.

B. Installer Qualifications: Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

C. Metal roof panel attachment shall meet the requirements of Factory Mutual 4771 – Class 1 Rating.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Refer to Section 01 40 00 Quality Requirements.

B. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.

C. Store roof panel materials on dry, level, firm, and clean surface. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.

1.7 WARRANTY:

A. Refer to Section 01 77 00 Closeout Procedures.

B. Material Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. The items covered by the warranty include structural performance and finish performance.
   1. Warranty Period: Two (2) years from date of Substantial Completion.

C. Installers "Weather-tight" Warranty: The Manufacturer Certified Installer shall provide a "leak-free" roofing warranty in which the installer agrees to repair leaks discovered in the roofing system under the terms outlined by the roofing manufacturer within the specified warranty period.
   1. Warranty Period: Two (2) years from date Substantial Completion.

D. Weather-tight Warranty: Provide manufacturer's limited weathertightness warranty in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Twenty (20) years from date Substantial Completion, or 20 years and 3 months from the date of shipment from manufacturer's plant, whichever occurs first.

E. Finish Warranty: Standard form in which manufacturer agrees to repair or replace metal panels that evidence deterioration of fluoropolymer finish, including flaking or peeling from approved primed metal substrate, chalk in excess of 8 when tested in accordance with ASTM D4214, Method A, and /or color fading in excess of 5 ΔE Hunter units on panels when tested in accordance with ASTM D2244.
   1. Warranty Period: Twenty (20) years from date Substantial Completion, or 20 years and 3 months from the date of shipment from manufacturer's plant, whichever occurs first.

PART 2 – PRODUCTS

2.1 MANUFACTURER:

A. Morin - a Kingspan Group Company; 685 Middle Street, Bristol, Connecticut 06010; 1-800-640-9501 (Toll Free); (www.morincorp.com)

B. Basis of Design: Morin SLW "Vertical-Rib, Snap-Joint Standing Seam Metal Roof Panels".

C. Substitution Limitations:
   1. Submit written request for approval of substitutions to the Architect a minimum of 14 days prior to the date for receipt of bids. Include the following information:
      a. Name of the materials and description of the proposed substitute.
      b. Drawings, cut sheets, performance and test data.
      c. List of projects similar scope and photographs of existing installations.
      d. Other information necessary for evaluation.
   2. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.
   3. Substitutions following award of contract are not allowed except as stipulated in Division 01 – General Requirements.

2.2 PERFORMANCE REQUIREMENTS:

A. Structural Performance:
   1. Roof assembly shall be tested for structural performance under uniform static air pressure differences in accordance with ASTM E1592.
      a. Uniform Pressure: as indicated on drawings; acting inward or outward.
   2. Roof assembly shall be approved by the Florida Building Code (FBC) for impact resistance and uplift in accordance with Product Approval.
   3. Snow Loads: [insert snow load]
   4. Deflection: Panel shall be limited to L/240.

B. Metal roof panels shall be capable of withstanding a 250 pound concentrated load applied to a 4 square inch area in the middle of the panel. No noticeable buckling or permanent distortion of the panel shall occur.

C. Water Penetration under Static Pressure: Provide metal roof panel systems designed to resist penetration of water under static pressure. Testing shall be based on ASTM E331. Roof panels when tested shall have no water leakage at 40.0 pounds per square foot.

D. Air Infiltration: Provide metal roof panel assemblies designed to resist air infiltration. Testing shall be done based on ASTM E283 and E1680. Roof panels when tested shall have a maximum air leakage of 0.153 cfm per square feet of fixed roof area at a minimum static air-pressure differential of 40.0 foot pounds per square foot.

E. Wind Uplift Resistance:
   1. Roof assembly shall comply with UL 580 for wind uplift resistance; class [UL 30] [UL 60] [UL 90]
   2. FM Global Approvals; per FM Approval Standard 4471.
      a. Metal roof panels attachment shall meet the requirements of FM Class 1A-120.
      b. Hailstorm Rating: SH.

F. Energy Performance:
   1. Energy Star Qualified: Metal panels shall meet the requirements of Energy Star Roofing Products for [low-slope] [steep slope].
   2. Solar Reflectance Index: Panels shall have a solar reflectance Index of not less than [78 for low-sloped roofs] [29 for steep sloped roofs].

G. Finish Characteristics:
   1. Gloss: 15 +/- 5 tested in accordance with ASTM D523
   2. Pencil Hardness: HB – H tested in accordance with ASTM D3363
   3. Flexibility, T-Bend: 1-2T bend tested in accordance with ASTM D4145
   4. Flexibility, Mandrel: No cracking tested in accordance with ASTM D522
   5. Adhesion: No adhesion loss tested in accordance with ASTM D3359
   6. Reverse Impact: No cracking or adhesion loss tested in accordance with ASTM D2794
   7. Abrasion Resistance: 65 +/- 10 liters tested in accordance with ASTM D968
   8. Graffiti Resistance: Minimal effect
   9. Acid Pollutant Resistance: No effect tested in accordance with ASTM D1308
   10. Salt Fog Resistance: Passes 1000 hours tested in accordance with ASTM B117
   11. Cyclic Salt Fog and UV Exposure: Passes 2016 hours tested in accordance with ASTM D5894
   12. Humidity Resistance: Passes 1500 hours when tested in accordance with ASTM D2247 and D714
   13. Color Retention: Passes 5000 hours when tested in accordance with ASTM G153 and G154
   14. Chalk Resistance: Maximum chalk is a rating of 8 when tested in accordance with ASTM D4214, Method A
   15. Color Tolerances: Greater than 5ΔE units on panels when tested in accordance with ASTM D2244.

2.3 ROOF PANEL MATERIALS:

A. Steel:
   1. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792, Class AZ50 coating designation, Grade 40.
   2. [Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation]
   3. Gauge: 22

2.4 ROOF PANELS:

A. Roof Panel Descriptions:
   1. Panel Width: 16 inches
   2. Profile: SLW
   3. Seam Height: 1 inches
   4. Texture: Smooth

2.5 INSULATION:

A. Not Used.

2.6 ACCESSORIES:

A. Roof panel accessories: Provide accessories as required for a complete installation. Accessories shall be as indicated on approved shop drawings and per manufacturer's approved standard details. Match material and finish of metal roof panels.
   1. Fasteners: Fasteners as recommended by manufacturer.
   2. Concealed Anchor Clips: Floating anchor clip, two piece.
   3. Backing Plates: Provide metal backing plates at panel end splices fabricated from material recommended by manufacturer.
   4. Closure Strips: Provide closed cell closure strips, minimum 1 inch thick matching metal roof panel profile.

B. Flashing and Trim:
   1. Fabricate flashing and trim from same material as roof panels unless otherwise noted. Finish to match metal roof panels.
   2. Locations include, but are not limited to the following: Drips, eave and rake edges, roof penetrations, hips, and valleys.
   3. Trim shall be provided under Section 07 60 00 - Flashing and Sheet Metal".

C. Panel Sealant:
   1. Joint Sealant: ASTM C920 as recommended in writing by metal roof panel manufacturer.
   2. Butyl Tape: Per panel manufacturer's recommendations for panel to panel and panel to trim seal.
   3. Butyl Sealants: Non-skinning type per panels manufacturer's recommendations

D. Snow Guards:
   1. Materials: Clamps, brackets and clips shall be fabricated from 6061-T6 aluminum extrusions conforming to ASTM B221or aluminum castings conforming to ASTM B85.
   2. Clamp Model: As recommended by clamp manufacturer and as approved by metal roof panel manufacturer.
   3. Fasteners: Stainless steel.
   4. Color Strips: Same material and finish as metal roof panels.
   5. Snow and Ice Clips: Aluminum, with rubber foot, minimum 3 inches wide.
   6. Manufacturer: "#76 ColorGard" by Alpine Snowguards.

2.7 FABRICATION:

A. Metal roof panels shall be formed to lap with edges of adjacent panels which are then mechanically attached to roof deck using fasteners and concealed anchor clips. Anchor clips are then machine seamed into standing seam.

B. Fabricate metal roof panels with joints between panels designed to form weathertight seals.

C. Curved roof panels: Panels shall be factory or field curved as approved by manufacturer.

D. Flashing and Trim Accessories: Fabricate steel trim accessories to comply with recommendations outlined in SMACNA's "Architectural Sheet Metal Manual".

2.8 FINISHES:

A. Steel:
1. Finish and Color:
a. Color:
1) Exposed Surface: To Be Selected from Morin standard colors.
2) Concealed Surface: Manufacturer's standard primer.
b. Finish System:
2) 1.0 mil. Fluropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70%) MICA color coat.

PART 3 – EXECUTION

3.1 EXAMINATION:

A. Provide field measurements to manufacturer as required to achieve proper fit of the metal roof panels to building envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.

B. Supporting Steel: All structural supports required for installation of panels shall be by others. Support members shall be installed within the following tolerances:
1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.
2. Plus or minus ¼ inch cumulative in 20 feet in any direction along plane of framing.
3. Plus or minus ½ inch from framing plane over entire roof.

C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.

3.2 PANEL INSTALLATION:

A. Apply sealant to joints per manufacturer's recommendations and approved shop drawings.

B. Install panels level, and true-to-line to dimensions and layout indicated on approved shop drawings.

C. Installation shall be in accordance with manufacturer's installation guidelines and recommendations. Roof panels shall be installed weathertight, without distortion, buckles or waves.

D. Seaming of panels shall be done as recommended by manufacturer:

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

4. Watertight Installation:

   a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
   b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
   c. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

E. Cutting and fitting of panels shall be neat, square and true. Torch cutting is prohibited.

F. Snow Guards: Install snow guards per manufacturers installation instructions and approved shop drawings. Attach to standing seams using aluminum clamp. Install color matched insert after snow guard installation is complete.

3.3 FLASHING AND TRIM INSTALLATION:

A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.

B. Apply sealant at trim, per manufacturer's details and approved shop drawings, for weathertight installation.

3.4 CLEANING AND PROTECTION:

A. Remove protective film immediately after installation.

B. Touch-up, repair or replace metal panels and trim that have been damaged.

C. After metal roof panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION 07 41 43

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PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Fiber cement lap siding, panels, shingle, trim, fascia, moulding and accessories, James Hardie HZ5 Engineered for Climate Siding.

B. Factory-finished fiber cement lap siding, panels, single, trim, fascia, moulding and accessories, James Hardie HZ5 Engineered for Climate Siding.

1.2 RELATED SECTIONS:

A. Section 05400 - Light Gage Metal Framing: Wall framing and bracing.

B. Section 06100 - Rough Carpentry: Wood framing and bracing.

C. Section 06100 - Rough Carpentry: Sheathing.

D. Section 07210 - Insulation: Exterior wall insulation.

1.3 REFERENCES:

A. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets

B. ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS:

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE:

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS:

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY:

A. Product Warranty: Limited, non-pro-rated product warranty.
1. HardiePlank HZ5 lap siding for 30 years.
2. HardiPanel HZ5 vertical siding for 30 years.
3. HardieSoffit HZ5 panels for 30 years.
4. HardieShingle HZ5 siding for 30 years.
5. Artisan HZ5 lap siding for 30 years.

B. Product Warranty: Limited, product warranty.
1. HardieTrim HZ and HZ5 boards for 15 years.

C. Finish Warranty: Limited product warranty against manufacturing finish defects.
1. When used for its intended purpose, properly installed and maintained according to James Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

D. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: request info (info@jameshardie.com); Web: www.jameshardiecommercial.com

B. Substitutions: Not permitted.

C. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01600.

2.2 SIDING:

A. HardiePlank HZ5 lap siding, HardiPanel HZ5 vertical siding, HardieSoffit HZ5 panels and HardieShingle HZ5 siding requirement for Materials:
1. Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
2. Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
3. Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
4. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product.
5. National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).
6. City of Los Angeles, Research Report No. 24862.
7. Miami Dade County, Florida Notice of Acceptance 07-0418.04.
8. US Department of Housing and Urban Development Materials Release 1263d.
9. California DSA PA-019.
10. City of New York M EA 223-93-M.
11. Florida State Product Approval FL889.
12. Texas Department of Insurance Product Evaluation EC-23.

B. Artisan HZ5 lap siding requirement for Materials:
   1. Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
   2. Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
   3. Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
   4. Warnock Hersey Product Listing.
   5. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product.
   6. Florida State Product Approval FL10477.
   7. Miami Dade County, Florida Notice of Acceptance 08-0514.11.
   8. Texas Department of Insurance Product Evaluation EC-55.
   9. Manufacturer's Technical Data Sheet.

C. Lap Siding: Artisan HZ5 Lap Siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Smooth 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
   2. Type: Smooth 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
   3. Type: Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
   4. Type: Texture 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
   5. Type: Texture 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
   6. Type: Texture 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

D. Lap Siding: HardiePlank HZ5 Lap siding with a sloped top, beveled drip edge and nailing line as manufactured by James Hardie Building Products, Inc.
   1. Type: Smooth 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
   2. Type: Smooth 6-1/4 inches (159 mm) with 5 inches (127 mm) exposure.
   3. Type: Smooth 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
   4. Type: Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
   5. Type: Smooth 9-1/4 inches (235 mm) with 8 inches (203 mm) exposure.
   6. Type: Smooth 12 inches (305 mm) with 10-3/4 inches (273 mm) exposure.
   7. Type: Select Cedarmill 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
   8. Type: Select Cedarmill 6-1/4 inches (159 mm) with 5 inches (127 mm) exposure.
   9. Type: Select Cedarmill 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
   10. Type: Select Cedarmill 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

E. Lap Siding: HardiePlank HZ5 Lap siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Beaded Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
   2. Type: Beaded Cedarmill 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

F. Vertical Siding: HardiePanel HZ5 siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Smooth Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   2. Type: Smooth Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   3. Type: Smooth Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   4. Type: Cedarmill Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   5. Type: Cedarmill Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   6. Type: Cedarmill Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   7. Type: Stucco Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   8. Type: Stucco Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   9. Type: Stucco Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   10. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   11. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   12. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).

G. Shingle Siding: HardieShingle HZ5 siding as manufactured by James Hardie Building Products, Inc.
   1. Type: HardiShingle Individual Shingles 6 inches (152 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   2. Type: HardiShingle Individual Shingles 8 inches (203 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   3. Type: HardiShingle Individual Shingles 12 inches (305 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   4. Type: HardieShingle Straight-Edge Notched Panel 48 inches (1219 mm) wide by 16 inches (406mm) high with 7 inches (178 mm) exposure.
   5. Type: HardieShingle Staggered-Edge Notched Panel 48 inches (1219 mm) wide by 16 inches

(406mm) high with 7 inches (178 mm) exposure.

6. Type: HardieShingle Half Round Notched Panel 48 inches (1219 mm) wide by 19 inches (483mm) high with 7 inches (178 mm) exposure.

H. Trim:

1. HardieTrim HZ5 boards and HardieTrim HZ boards as manufactured by James Hardie Building Products, Inc.
2. HardieTrim HZ5 Fascia boards as manufactured by James Hardie Building Products, Inc.
3. HardieTrim HZ5 Crown moulding manufactured by James Hardie Building Products, 1nc.
4. Artisan HZ5 Accent trim as manufactured by James Hardie Building Products, Inc.

2.3 FASTENERS:

A. Wood Framing Fasteners:

1. Wood Framing: 4d common corrosion resistant nails.
2. Wood Framing: 6d common corrosion resistant nails.
3. Wood Framing: 8d box ring common corrosion resistant nails.
4. Wood Framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
5. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
6. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2-1/2 inches (64 mm) corrosion resistant siding nails.
7. Wood Framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
8. Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
9. Wood Framing: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.
10. Wood Framing: No. 11 gauge 1-1/4 inches (32 mm) corrosion resistant roofing nails.
11. Wood Framing: No. 11 gauge 1-1/2 inches (38 mm) corrosion resistant roofing nails.
12. Wood Framing: No. 11 gauge 1-3/4 inches (44 mm) corrosion resistant roofing nails.

B. Metal Framing:

1. Metal Framing: 1-1/4 inches (32 mm) No. 8-18 by 0.375 inch (9.5 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
2. Metal Framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
3. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant ribbed buglehead screws.
4. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.311 inch (7.9 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
5. Metal Framing: 1.5 inch (38mm) [AGS-100] .100 inches by 25 inches (2540 mm by 635 mm) ET&F Pin or equivalent pneumatic fastener.

C. Masonry Walls (CMU):

1. Masonry Walls: Aerico Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) long corrosion resistant nails.

2.4 FINISHES:

A. Factory Primer: Provide factory applied universal primer.

1. Primer: Factory primed by James Hardie.
2. Topcoat: Refer to Section 09900 and Exterior Finish Schedule.

B. Factory Finish: Refer to Exterior Finish Schedule.

1. Product: ColorPlus Technology by James Hardie.
2. Definition: Factory applied finish; defined as a finish applied in the same facility and company that manufactures the siding substrate.
3. Process:
   a. Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.

b. Each finish color must have documented color match to delta E of 0.5 or better between product lines, manufacturing lots or production runs as measured by photospectrometer and verified by third party.

4. Protection: Factory applied finish protection such as plastic laminate that is removed once siding is installed
5. Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.

C. Factory Finish Color for Trim, Soffit and Siding Colors:
1. Alpine Frost JH50-10.
2. Arctic White JH10-20.
3. Autumn Tan JH20-20.
4. Boothbay Blue JH70-20.
5. Chestnut Brown JH80-30.
6. Cobble Stone JH40-10.
7. Countrylane Red JH90-20.
8. Evening Blue JH70-30.
9. Frosted Green JH60-20.
10. Harris Cream JH80-10.
11. Heathered Moss JH50-20.
12. Iron Gray JH90-30.
13. Khaki Brown JH20-30.
14. Light Mist JH70-10.
15. Monterey Taupe JH40-20.
16. Mountain Sage JH50-30.
17. Navajo Beige JH30-10.
18. Parkside Pine JH60-30.
19. Sail Cloth JH20-10.
20. Sandstone Beige JH30-20.
21. Soft Green JH60-10.
22. Timber Bark JH40-30.
23. Traditional Red JH90-10.
24. Tuscan Gold JH80-20.
25. Woodland Cream JH10-30.
26. Woodstock Brown JH30-30.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Nominal 2 inch by 4 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
1. Install water-resistive barriers and claddings to dry surfaces.
2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
3. Protect siding from other trades.

D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
1. Install water-resistive barriers and claddings to dry surfaces.
2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
3. Protect siding from other trades.

3.2 PREPARATION:

A. Clean su:rfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Install a water-resistive barrier is required in accordance with local building code requirements.

D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

E. Install Engineered for ClimateTM HardieWrapTM weather barrier in accordance with local building code requirements.

F. Use HardieWrapTM Seam Tape and joint and laps.

G. Install HardieWrapTM flashing, and HardieWrapTM Flex Flashing

3.3 INSTALLATION - HARDIEPLANK HZ5 LAP SIDING AND ARTISAN HZ5 LAP SIDING:

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

D. Align vertical joints of the planks over framing members.

E. Maintain clearance between siding and adjacent finished grade.

F. Locate splices at least one stud cavity away from window and door openings.

G. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

H. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.4 INSTALLATION - HARDIEPANEL HZ5 VERTICAL SIDING:

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Block framing between studs where HardiePanel siding horizontal joints occur.

C. Install metal Z flashing and provide a 1/4 inch (6 mm) gap at horizontal panel joints.

D. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

E. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

F. Maintain clearance between siding and adjacent finished grade.

G. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.

H. Factory Finish Touch Up: Apply touch up paint to cut edges in accordance with manufacturer's printed instructions.
   1. Touch-up nicks, scrapes, and nail heads in pre-finished siding using the manufacturer's touch-up kit pen.
   2. Touch-up of nails shall be performed after application, but before plastic protection wrap is removed to prevent spotting of touch-up finish.
   3. Use touch-up paint sparingly. If large areas require touch-up, replace the damaged area with new pre-finished siding. Match touch up color to siding color through use of manufacturer's branded touch-up kits.

3.5 INSTALLATION - HARDIE HZ5 SHINGLESIDE CLADDING:

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Substrate: Install a minimum 7/16 inch (11 mm) thick OSB wall sheathing or equivalent braced walls complying with applicable building codes.

C. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall.

D. Maintain clearance between siding and adjacent finished grade.

E. Apply starter course of 10 inches (254 mm) shingles or 9-1/2 inches (241 mm) lap siding overlapping the starter strip.

F. Apply subsequent courses horizontally with a minimum 10 inch overlap at the top and a minimum 2 inch (51 mm) side lap. The bottom edge of the first two courses overlaps the starter strip.

G. Fasten between 1/2 inch (13 mm) and 1 inch (25 mm) in from the side edge and between 8-1/2 inches (216 mm) and 9 inches (229 mm) up from the shingle bottom edge.

H. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

I. Ensure vertical joints of overlapping shingle course do not align.

J. Wind Resistance: Where a specified level of wind resistance is required, Hardie Shingle siding is installed to substrate and secured with a minimum two fasteners described in Table No. 6, 7 and 8 in National Evaluation Service Report No. NER-405.

3.6 INSTALLATION - HARDIETRIM HZ5 BOARDS:

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Maintain clearance between trim and adjacent finished grade.

E. Trim inside corner with a single board trim both side of corner.

F. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.

G. Allow 1/8 inch gap between trim and siding.

H. Seal gap with high quality, paint-able caulk.

I. Shim frieze board as required to align with corner trim..

J. Fasten through overlapping boards. Do not nail between lap joints.

K. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.

L. Shim frieze board as required to align with corner trim.

M. Install HardieTrim Fascia boards to rafter tails or to sub fascia.

3.7 FINISHING:

A. Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and one coat of either, 100 percent acrylic or latex or oil based, exterior grade topcoats or two coats high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

B. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.8 PROTECTION:

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 46 10

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.2 DESCRIPTION OF WORK:

A. The work of this Section includes, but is not limited to:

1. Metal and membrane flashings.
2. Metal gravel stops.

1.3 LEED BUILDING GENERAL REQUIREMENTS:

A. Implement practices and procedures to meet the project's environmental goals, which include achieving a LEED™ 2009 New Construction Gold rating. Specific project goals which may impact this and the other sections of this specification include: use of recycled-content materials; use of locally-manufactured materials; use of low-emitting materials; use of certified wood products; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this Section and other Sections of the contract documents, are implemented to the fullest extent. Substitutions or other changes to the work shall not be allowed if such changes substantially compromise the stated LEED Building criteria.

Comply with LEED (Leadership in Energy and Environmental Design) Green Building Rating System BD+C, Version 3, Gold.

1.4 RELATED WORK:

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:

1. Section 01 74 19, Construction & Demolition Waster Management
2. Section 01 81 13, Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints & Coatings
3. Section 01 81 19, Construction Indoor Air Quality (IAQ) Management
4. Section 03 45 00, Architectural Precast Concrete
5. Section 04 20 00, Unit Masonry
6. Section 06 10 00, Rough Carpentry
7. Section 07 54 19, PVC Membrane Roofing, roof membrane flashings.
8. Section 07 92 00, Joint Sealants

1.5 REFERENCES:

A. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.

B. ASTM - American Society For Testing and Materials.

C. FS - Federal Specifications.

1.6 SUBMITTALS:

A. Shop Drawings: Show the manner of forming, jointing, and securing the metal flashings and trim. Include expansion joint connections, and the method of forming waterproof connections to adjoining construction. Include statement that materials are physically compatible.

B. Product Data: Catalog sheets, specifications, installation instructions for each item specified except for shop or job formed items, solder, flux, and bituminous coating.

C. Samples:

1. Materials for Flashings: One 6 inch sq piece, for each type material specified.
2. Anchors: Six, each type required.
3. Cap Flashings: Full section, 6 inches long.
4. Gravel Stop: Full section, 6 inches long.
5. Coping: Full section, 12 inches long.

1.7 QUALITY ASSURANCE:

A. Except as otherwise shown or specified, comply with applicable recommendations, details, and standards of SMACNA.

B. Manufacturer's Recommendations: For factory fabricated items, follow the manufacturer's recommendations and installation instructions unless specifically shown or specified otherwise.

C. Mock Up: Mock up of exterior wall including flashing and sheet metal is required.

1.8 DELIVERY, STORAGE AND HANDLING:

A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Protect from damage.

B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.9 SEQUENCING AND SCHEDULING:

A. Conference: convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

B. Perform work of this section in coordination with other sections to provide the highest quality work which best fulfills the intent requirements of this work.

1.10 PROJECT CONDITIONS:

A. Make the roof and all uncompleted flashings watertight at the end of each work day.

PART 2 - PRODUCTS

2.1 FLASHING AND SHEET METAL:

A. Self-adhesive, rubberized asphalt through wall flashing:

1. Manufacturer: W.R. Grace & Co.
2. Product: Perm-A-Barrier Wall Flashing

B. Self-adhesive, rubberized asphalt detail membrane:

1. Manufacturer: W.R. Grace & Co.
2. Product: Perm-A-Barrier Detail Membrane

C. Self-adhesive, rubberized asphalt waterproofing membrane:

1. Manufacturer: W.R. Grace & Co.
2. Product: Perm-A-Barrier Wall Membrane

D. Miscellaneous waterproofing components:

1. Manufacturer: W.R. Grace & Co.
2. Products: All primers, sealants, mastic, etc. required for a complete system.

E. Concealed metal flashing: Concealed metal flashing shall be brake formed stainless steel sheet; dead soft fully annealed stainless steel sheet, ASTM A666, Type 302/304, 2D, dull finish; 0.032 in. thick (20 gage) except as otherwise indicated.

F. Sheet Aluminum: ASTM B209, alloy 3003-H14, 0.060 inch thickness minimum. Use for coping, gravel stops and brake metal.

1. Finish: Clear anodized.

2.2 MISCELLANEOUS MATERIALS:

A. Fasteners: Match material beign fastened for both type of material and finish.

B. Isolation Coating: SSPC paint 12.

C. Slip Sheet: 5 lb. rosin building paper.

D. Plastic Underlayment: 6 mil carbonated polyethylene film, FS L-P-512.

E. Reglets: Metal units of type and profile indicated or required which are compatible with flashings used.

F. Solder: ASTM B 32, as required.

G. Accessories: Provide all clips, cleats, straps, anchors and similar items necessary to properly complete the work. Provide accessories that are compatible with sheet metal materials used and which are of sufficient size and gage to perform as intended.

2.3 FABRICATION:

A. Shop fabricate work to the greatest extent possible. Fabricate work to be truly straight, plumb, level and square, and to provide the best possible watertight, weatherproof performance with expansion provisions in running work.

B. Provide work to sizes, shapes, and profiles indicated on approved shop drawings. Comply with referenced standards. Minimize oil-canning, buckling, tool marks and other defects.

C. Make work with uniform, watertight joints. Make seams as inconspicuous as possible.

D. Isolate dissimilar materials with isolation coating or other permanent separation acceptable to the Architect.

2.4 ROOF FASCIA/GRAVEL STOP SYSTEM:

A Provide materials and fascia/gravel stop systems by one of the following manufacturers, that meet or exceed the requirements specified.

1. MM Systems Corporation
2. W.P. Hickman Co.
3. Metal-Era Roof Edge Systems

B. Fascia/Gravel Stop System: Prefabricated aluminum fascia system shall be prefabricated units consisting of formed aluminum fascia with hold down cleat and matching splice plates, “Form-Line Fascia System”, manufacturer by MM Systems Corporation; or “ Metal-Era Gravel Stop and Drip Edge”manufactured by Metal-Era Roof Edge Systems.

1. Fascia/Gravel stop size shall be as indicated on drawings.
2. Minimum thickness shall be 0.050 in.
3. Fascia/Gravel stop shall be furnished in 12 ft lengths, minimum.
4. Provide factory-fabricated corners and end caps.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Coordinate the Work of this Section with other Work for the correct sequencing of items that make up the entire system of weatherproofing or waterproofing.

3.2 PREPARATION:

A. Do not install the Work of this Section unless all necessary nailers, blocking and other supporting components have been provided.

B. Do not install the Work of this Section unless all substrates are clean and dry.

3.3 INSTALLATION:

A. Install flashing in continuous uninterrupted manner complete with all transitions, laps, splices, folds, seams necessary to ensure the diversion of water to the exterior. Work in close coordination with installation of exterior precast concrete, unit masonry, roofing, window, joint sealer and louver systems.

1. Apply materials within manufacturer's requirements for temperature and weather conditions.
2. Do not apply to wet or frozen substrates.
3. Do not allow contamination with dust or dirt.
4. Seal completely at edges, perimeter and penetrations.

B. Strictly comply with manufacturer’s instructions and recommendations and standard details and recommendations of SMACNA, except where more restrictive requirements are specified in this section. Provide locked and sealant locked joints as indicated on the Drawings.

C. Securely anchor work, but allow for thermal movement and building movement. Use concealed fasteners to the greatest extent possible. Install work to be permanently weatherproof and watertight. Provide continuous cleats at all edge conditions.

D. Bed metal flashing work in thick coating of roofing cement for watertight performance. Do not permit roofing cement to run or drip out from under sheet metal work under any conditions.

E. Provide reglets where indicated and where required. Coordinate installation with related and adjacent work.

F. Provide through-wall flashing at masonry walls. Overlap adjacent pieces of flashing minimum 2" and roll all overlaps with steel hand roller. Trim bottom edge of flashing minimum of 1/2" back from exposed face of the building. Staple vertical and horizontal joints. Apply a bead of sealant along top edge of flashing membrane and along seams and cuts as necessary and as recommended by manufacturer.

1. Fasten membrane and install in horizontal strips with 3 feet wide by 10inch long pieces, starting at the bottom of the wall. Fasten top edge 16 to 24 inches on center. Subsequent strips of membrane shall lap over the fasteners about 2 inches. Corners shall be reinforced with 18 inch wide membrane strips before applying the membrane.

G. Provide flashing at every obstruction to the downward flow of water. Design and install flashing to control and divert water to the exterior. Form at least 4" high end pans above lintels and similar conditions to extend the entire length of the lintel where possible. Flashing shall extend 4" minimum beyond end of lintel before it is panned (dammed). All seams in metal pan flashing shall be soldered to create a water tight joint.

3.4 TOLERANCES:

A. For exposed work, the following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work.

1. Allowable Variation from True Plumb, Level, and Line: +/- 1/8" in 20'-0"
2. Allowable Variation from True Plane of Adjacent Surfaces: +/-1/16"

3.5 ADJUSTING, CLEANING, PROTECTION:

A. Adjust work to conform to specified tolerances and appear uniform, straight and correct.

B. Touch-up damaged coatings and finishes to eliminate evidence of repair.

C. Repair minor damage to eliminate ail evidence of repair. Remove and replace work which cannot be satisfactorily repaired.

D. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned.

END OF SECTION 07 60 00

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PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. Flashing and Trim: Section 07 60 00.

1.2 SUBMITTALS:

A. Product Data: Catalog sheets, specifications, and installation instructions for each material specified.

B. Samples:
1. Gutter: 12 inches long, full section.
2. Downspout: 12 inches long, full section.
3. Hanger Brackets, Braces, and Stiffeners: One, each type.
4. Fasteners: Six, each type.
5. Sealant: One pint or standard tube.
6. Color Samples: Coil stock manufacturer's standard range of colors for finish specified.

C. Shop Drawings: Show method of forming, jointing, and securing the gutters and downspouts. Include attachment to adjoining construction.

1.3 DELIVERY, STORAGE AND HANDLING:

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store materials in a dry, protected, well-vented area.

C. Remove protective plastic surface film immediately before installation.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Prefinished Aluminum: Formed aluminum sheet, ASTM B 209, 3003-H14 alloy, fabricated from "tension leveled" coil stock.
1. Finish: Full strength 70 percent Kynar 500 Fluorocarbon Coating applied by the coil coating process. Minimum dry film thickness 1.0 mil.
2. Components:
a. Hung Gutter: .063 inch aluminum.
b. Downspouts: .025 inch aluminum.
c. Outlet Tube, Offsets, and Elbows: .025 inch aluminum.
d. Gutter Hanger Brackets: 1/8 inch by 1 inch prefinished aluminum bar with Kynar finish.
e. Gutter Braces: 1/4 inch by 1 1/2 inch prefinished aluminum bar with Kynar finish.
f. Gutter Stiffener: 1/8 inch x 3/4 inch aluminum bar.
g. Downspout Support Hanger: 3/16 inch by 1 inch aluminum.
h. Wire Strainers: Aluminum wire type.
3. Fasteners:
a. Screws, Bolts, and Other Fastening Accessories: Stainless steel
b. Rivets: Stainless steel, minimum diameter 3/16 inch.

B. Sealant:
1. Silicone, one part, low modulus.
2. Butyl rubber, one part.

2.2 FABRICATION:

A. Fabricate gutters, downspouts, and fittings to the shape and profile indicated on the Drawings. When fabrication details are not indicated follow the applicable requirements of the Architectural Sheet Metal Manual of the Sheet Metal And Air Conditioning Contractors National Association, Inc. (SMACNA).

1. Gutters and downspouts to be formed seamlessly. Form gutters and downspouts in compliance with SMACNA recommendations. Gutter expansion joints, if needed, to comply with SMACNA recommendations.

2.3 ACCESSORIES:

A. Splash Pad: Precast concrete, 3500 psi. Form splash pads with a sloped depressed center area. Approximate size, one foot wide x two feet long oriented in the direction of the roof slope.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Do not install the Work of this Section unless all necessary nailers, blocking and other supporting components have been provided.
   1. Coordinate installation of roof perimeter flashing with installation of gutter system.

3.02 INSTALLATION:

A. Connection to Existing Construction: Tie the items of Work in with the existing work to obtain watertight installation. Match the existing installation as much as practicable, unless otherwise specified. Repair and dress adjacent existing components as required to make secure and neat connections with new items.

B. Installation of Hung Gutters:
   1. Install gutter hanger brackets 3 feet oc. Install the brackets so there will be a slight pitch in the gutter towards the downspouts.
   2. Join and seal the gutter sections, end pieces, mitered corners, and outlet tubes.
   3. Install expansion joints where indicated on the drawings. If not indicated, place the expansion joints at mid points between the downspouts at maximum intervals of 48 feet.
      a. Form the expansion joints with end baffles conforming to the shape of the gutter. Join the baffles to the gutter section.
      b. Install a cover plate over the baffle.
   4. Install a continuous stiffener bar along the top front edge of the gutter. Fold the gutter around the stiffener bar so it is securely locked in place.
   5. Install gutter braces 3 feet o.c., staggered from the gutter hanger brackets. Secure the braces to the stiffener bar and to the back vertical portion of the gutter with brass or copper bolts.
   6. Secure the top back edge of the gutter to the gravel stop, eave flashing, or continuous cleat as indicated on the drawings.

C. Installation of Downspouts:
   1. Join the downspout sections with end joints that telescope at least 1-1/2 inches.
   2. Install necessary offsets and elbows.
   3. Secure downspout with hangers at top and bottom and 5'x 0" o.c. with a minimum of 2 hangers at each downspout section. Form hangers to keep downspouts 1 inch away from wall.
   4. Fasten downspouts to hangers with sheet metal screws.
   5. Secure hangers to masonry and concrete walls with machine bolts in lead shields and to wood walls with screws.
   6. Discharge Elbows: Fasten leader shoes to downspouts with a minimum of 3 sheet metal screws.
   7. Connection to Underground Drains: Fit the downspout neatly into the drain pipe or boot. Caulk the joint with lead wool and seal with sealant.

D. Installation of Splash Pads: Install splash pads under discharge elbows unless otherwise indicated.

END OF SECTION 07 71 23

PART 1 GENERAL

1.1 SUMMARY:

A. Work Includes:

1. Rail style snow guard system that attaches directly to the roof deck.
2. Coordinate installation of the proposed snow guard system with the manufacturer of the existing PVC roof membrane to assure proper installation and flashing of the proposed snow guard system brackets.

B. Related Sections:

1. Section 07 54 00: Thermoplastic Membrane
2. Section 07 60 00: Flashing and Sheet Metal

1.2 SYSTEM DESCRIPTION:

A. Components:

1. Drawings and Specifications are based on Alpine Snow Guard PP115 snow guard system (Alpine Snow Guards, 289 Harrel St. Morrisville, VT 05661, (888) 766-4273) and consists of a metal snow guard brackets with (2) stainless steel nuts and (2) bonded stainless steel and membrane isolation washers and,
2. Tubing (Snow Fence),
3. Couplings,
4. End Caps,
5. End Collars,
6. Ice Flags,
7. Fasteners
   a. To be of metal compatible with snow guards.
   b. Fasteners should be selected for compatibility with the roof deck.
   c. Fastener strength should exceed or be equal to that of the snow guard system.
8. Flashing Patch of appropriate size, material and method of installation to meet roof manufacturer's requirement for proper flashing.

B. Design Requirements:

1. Bracket spacing as recommended by manufacturer and as shown on drawings.
2. Install a minimum of 7 fasteners per snow guard base plate.

1.3 SUBMITTAL:

A. Submit manufacturer's specifications, standard detail drawings, installation instructions, and recommended layout.

1.4 QUALITY ASSURANCE:

A. Installer to be experienced in the installation of specified roofing material and snow guards for not less than 5 years in the area of the project.

1.5 DELIVERY / STORAGE / HANDLING:

A. Inspect material upon delivery and order replacements for any missing or defective items. Keep materials dry, covered and off the ground until installed.

PART 2 PRODUCTS

2.1 MANUFACTURER:

A. Alpine SnowGuards, a division of Vermont Slate & Copper Services Inc. 289 Harrel St. Morrisville, VT 05661, (888) 766-4273 www.alpinesnowguards.com.

B. Or approved equal as determined by Owner and Architect.

2.2 MATERIALS:

A. Snow Guard Bracket - 6000 Series Aluminum.

C. Base Plate - 11 gage 304 stainless steel with two 5/16" 304 stainless steel machine screws welded into countersinks.

D. Tubing:

1. Aluminum – 6000 Series, 1" outside diameter and .120" wall thickness, extruded.

E. Couplings:

1. Aluminum – 6000 Series
   a. Internal and concealed coupling 3" long.
   b. External and exposed coupling which can also serve as an expansion mechanism 5" long.

F. End Caps – Aluminum – 6000 Series

G. End Collars:

1. 6000 Series Aluminum.

H. Ice Flags:

1. 6000 Series Aluminum 3" wide x length (as needed).

I. Fasteners (can be purchased from others) to be compatible with chosen roof application and meet specified pull out values as shown in load test data.

2.3 FINISH (choose one):

A. Mill Finish – standard

PART 3 EXECUTION

3.1 EXAMINATION:

A. Substrate

1. Inspect structure on which snow guard system is to be installed and verify that it will withstand any additional loading that it may incur. Notify general contractor of any deficiencies before installing Alpine SnowGuards.
2. Verify that roofing material has been installed correctly prior to installing snow guards.

3.2 INSTALLATION:

A. Comply with architectural drawings and snow guard manufacturer's recommendations for location of system. Comply with manufacturer's written installation instructions for installation and layout.

END OF SECTION 07 72 53

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the Work of this Section.

1.2 DESCRIPTION OF WORK:

A. Provide fire stopping systems to prevent the passage of flame and the products of combustion through concealed spaces and openings as required by code including, but is not limited to, the following:
   1. Between edge of each floor at wall construction
   2. Between stories, unless within a fire-rated shaft
   3. Above wall or partitions indicated to extend to underside of structure above
   4. Concealed furring spaces behind finished surfaces
   5. Locations at pipes, conduits, ducts and other construction which passes through fire-rated assemblies
   6. Openings related to fire-extinguisher cabinets, recessed water coolers, mechanical and electrical panels, and all other systems that penetrate or interrupt fire-rated assemblies

1.3 RELATED WORK:

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:
   1. Section 07 92 00, Joint Sealants

1.4 REFERENCES:

A. UL 263 Fire Tests of Building Construction and Materials

B. UL 1479 Fire Tests of Through-Penetration Fire stops

C. UL2079 Standard for Safety Tests for Fire Resistance of Building Joint Systems

D. ASTM E 119 Methods of Fire Tests of Building Construction and Materials

E. ASTM E 814 Method of Fire Tests of Through-Penetration Fire Stops

1.5 DEFINITIONS:

A. UL Fire Resistance Directory: Product directory published yearly, with supplements, by Underwriters Laboratories Inc., containing listings and classifications in effect as of the published date for product categories covered by UL.

B. Factory Mutual Approval Guide: Product directory published yearly, with supplements, by Factory Mutual Research Corp., containing listed building products, materials, and assemblies which have been tested by Factory Mutual Research Corp., to recognized governing standards.

C. F Rating: Prohibits flame passage through the system and requires acceptable hose stream test performance.

D. T Rating: Prohibits flame passage through the system and requires the maximum temperature rise on the unexposed surface of the wall or floor assembly, on the penetrating item and on the fill material not to exceed 325 degrees F above ambient, and requires acceptable hose stream test performance.

E. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design,

installation and servicing of the required products. Personnel involved solely in sales do not qualify.

1.6 DESIGN REQUIREMENTS:

A. Devices and materials shall meet the hourly fire resistance ratings required by the Project as determined by UL 1479, or ASTM E 814 and be listed and detailed in the UL Fire Resistance Directory or the Factory Mutual Approval Guide.
   1. Exception: Where no listed designs exist that meet the requirements of a specific project condition, submit details and manufacturer's written recommendations for a design meeting the requirements. Include evidence of engineering judgment and extrapolation from listed designs.

1.7 SUBMITTALS:

A. Submittals Package: Submit the following items specified below the same time as a package:
   1. Product Data
   2. Samples
   3. Quality Control Submittals
   4. Fire stop Schedule

B. Product Data: Catalog sheets, specifications and installation instructions for each fire stop device and material.
   1. Indicate design number for each fire stop proposed to be used which is detailed in the UL Fire Resistance Directory, or the Factory Mutual Approval Guide.
   2. State the specific locations where each fire stop system is proposed to be installed.

C. Samples: One of each product if requested.

D. Quality Control Submittals:
   1. Design Data: Show details and include engineering information and manufacturer's written recommendations required under Design Requirements Article for each proposed fire stop if other than a design detailed in the UL Fire Resistance Directory, or the Factory Mutual Approval Guide.
      a. State the specific locations where each fire stop is proposed to be installed.
   2. Installer's Qualifications Data:
      a. Name of each person who will be performing the Work and their employer's name, business address and telephone number.
      b. Names and addresses of 3 similar projects that each person has worked on during the past 5 years.
   3. Company Field Advisor Data:
      a. Name, business address and telephone number of Company Field Advisor secured for the required services.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor, and listing of services and each product specifically listed for this Project for which Company Field Advisor is given authorization by the Company to render advice.

E. Fire stop Schedule: Submit schedule itemizing the following:
   1. Manufacturer's product reference numbers and/or drawing numbers
   2. UL or Factory Mutual Research Corp. Design Number
   3. Location of fire stop material
   4. Penetrating Item Description/Limits: Material, size, insulated or un-insulated, and combustibility
   5. Maximum allowable annular space or maximum size opening
   6. Wall type construction
   7. Floor type construction
   8. Hourly Fire resistance rating of wall or floor
   9. F rating
   10. T rating, if available

1.8 QUALITY ASSURANCE:

A. Installer Qualifications: The persons installing the fire stopping and their supervisor shall be personally experienced in fire stop work and shall have been regularly employed by a company installing fire stopping for a minimum of 3 years.

B. Pre-Installation Conference: Before the fire stop work is scheduled to commence, a conference will be called by the Construction Manager at the Site for the purpose of reviewing the Contract Documents and discussing requirements for the Work. The conference shall be attended by related trade Contractors (if any), their qualified fire stopping installers, and associated fire stopping manufacturer's Company Field Advisors.

C. Container/Package Labels: Include manufacturer's name and identifying product number, date of manufacturer, lot number, shelf life (if applicable), qualified testing and inspecting agency classification marking, curing time, and mixing instructions for multi-component materials.

D. Company Field Advisor: Secure the services of a Company Field Advisor for the following:
1. Render advice regarding suitability of fire stopping materials and methods.
2. Assist in completing fire stop schedule.
3. Attend pre-installation conference.

E. Asbestos-Free Products: Provide fire stopping products containing no detectable asbestos as determined by method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

F. Fire Resistance: Provide materials and construction which are identical to assemblies whose fire-resistance rating has been tested in compliance with ASTM E 119, UL 263, ANSI A2.1 or NFPA 251 by independent agencies acceptable to the Architect and authorities having jurisdiction.

G. Burning Characteristics: Provide materials whose surface burning characteristics, when tested in compliance with ASTM E84 are as follows:
1. Flame Spread: Not more than 25.
2. Smoke Developed: Not more than 25.

1.9 DELIVERY, STORAGE, AND HANDLING:

A. Deliver fire stopping materials to the Site in original, new unopened containers or packages bearing manufacturer's printed labels.

B. Store and handle fire stopping materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, etc.

1.10 PROJECT CONDITIONS:

A. Environmental Requirements:
1. Temperature: Do not install fire stopping materials when ambient or substrate temperatures are outside limits permitted by manufacturer of fire stopping materials.
2. Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing, and performance of the materials.
3. Ventilation: Provide sufficient ventilation wherever fire stopping materials are installed in enclosed spaces. Follow manufacturer's recommendations.

1.11 SEQUENCING AND SCHEDULING:

A. Perform work of this section and other sections in proper sequence so that this work will not be damaged and will be installed prior to installation of enclosing or concealing work.

PART 2 - PRODUCTS

2.1 FIRE STOPPING-GENERAL:

A. Through-Penetration Fire Stop Devices, Forming Materials, And Fill, Void or Cavity Materials: As listed in the UL Fire Resistance Directory, or the Factory Mutual Approval Guide.

1. For fire stopping exposed to moisture, furnish products that do not deteriorate when exposed to this condition.
2. For fire stopping systems exposed to view, furnish products with flame-spread values of less than 25 and smoke developed values less than 50, as determined per ASTM E 84.
3. For penetrations for piping services below ambient temperature, furnish moisture-resistant through-penetration fire stop systems.
4. For penetrations involving insulated piping, furnish through-penetration fire stop systems not requiring removal of insulation.

B. Accessories: Components required to install fill materials as recommended by the fire stopping manufacturer for particular approved fire rated system.

C. Identification Labels:
1. Furnished by fire stopping manufacturer of suitable material for permanent field identification of through-penetration fire stops.
2. Identify the following:
   a. "WARNING – FIRE STOP MATERIAL"
   b. Company Name
   c. Product Catalog number
   d. F rating
   e. T rating, if available
3. Field fabricated labels are not acceptable.

D. Compatibility: Provide fire stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the fire stopping under conditions of service and application, as demonstrated by fire stopping manufacturer based on testing and field experience.

2.2 MINERAL WOOL:

A. Provide loose mineral wool, rated noncombustible when tested in accordance with ASTM E 136, free of asbestos and glass fiber, and suitable for in-place density of 6 pcf to 12 pcf.

2.3 CAULK AND PUTTY:

A. Provide one of the following products, or Architect approved equal, that meet or exceed specified requirements:
1. USG Fire Code Compound
2. Bio Therm; Bio Fireshield.
3. Fire-Barrier Series; 3M Fire Protection Products.
4. Silicone Fire stop Foam 2001, and Sealant 2000; Dow Corning Corp.
5. Hilti; Fire Protection Products

2.4 FIRE STOP MORTAR:

A. Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogenous mortar.

B. Provide one of the following products, or Architect approved equal, that meet or exceed specified requirements:
1. Novasit K-10; Bio Fireshield
2. KBS Mortar Seal; International Protective Coatings Corp.
3. CMP Fire stop Compound; Nelson Fire stop.
4. STI SpecSeal Mortar.

2.5 FIRE STOP COLLARS:

A. Provide pre-manufactured fire protective pipe sleeves equal to one of the following products, or Architect approved equal, that meet or exceed specified requirements:
1. Bio-Fireshield Fire Stop Collars.
2. STI SpecSeal Fire Stop Collars.

3. Hilti CP 642 Fire Stop Collar.

2.6 FIRE STOP BAGS/PILLOWS:

A. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth casesfilled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.

B. Provide one of the following products, or Architect approved equal, that meet or exceed specified requirements:
1. Fire stop Pillows; Bio Fireshield.
2. KBS Sealbags; International Protective Coatings Corp.
3. PLW Fire stop Pillow; Nelson Fire stop.
4. STI SpecSeal Pillows.
5. Hilti; Fire Protection Products

2.7 WRAP STRIPS:

A. Single-component, elastomeric sheet with aluminum foil on one side. Provide one of the following products, or Architect approved equal, that meet or exceed specified requirements:
1. SpecSeal Wrap Strip; STI.
2. Fire Barrier FS195 Wrap Strip; 3M.
3. CS2420 Intumescent Wrap, Hilti Construction Chemicals, Inc.

2.8 DUCT WRAPS:

A. A foil-encapsulated, non-combustible, inorganic, flexible fireproofing wrap used in combination with silicone sealant for use at duct assemblies. Provide the following products:
1. FireMaster Duct Wrap and Fire Barrier 2000+ Silicone Sealant; 3M.

2.9 MIXING:

A. For those products requiring mixing prior to application, comply with fire stopping manufacturer's directions for accurate proportioning of materials, water (if required), *type* of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce fire stopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. The Installer shall examine substrates, supports, and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.2 PREPARATION:

A. Clean out openings immediately before installation of through-penetration fire stopping. Comply with recommendations of fire stopping manufacturer and the following requirements:
1. Remove foreign materials from surfaces of openings, and from penetrating items that could interfere with adhesion of fire stopping.
2. Clean opening and penetrating items to produce clean, sound surfaces capable of developing optimum bond with fire stopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form release agents from concrete.

B. Protection:
1. Protect surfaces adjacent to through-penetration fire stops with non-staining removable masking tape or other suitable covering to prevent fire stopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be

permanently stained or damaged by such contact or that would be caused by cleaning methods used to remove smears from fire stopping materials.

C. Substrate Priming:
   1. Prime substrates in accordance with the fire stopping manufacturer's printed installation instructions using recommended products and methods.
   2. Do not allow primer to spill or migrate onto adjoining exposed surfaces.

3.3 INSTALLATION OF THROUGH PENETRATION FIRE STOPS:

A. Use through-penetration fire stop devices, forming materials, and fill, void or cavity materials to form through-penetration fire stops to prevent the passage of flame, and limit temperature rise of the unexposed surface as detailed in the UL Fire Resistance Directory, or the Factory Mutual Approval Guide.
   1. Where applicable design is not detailed in the Directories, use forming materials and fill, void or cavity material to form through-penetration fire stop in accordance with approved printed details and installation instructions from the company producing the forming materials and fill, void or cavity material.

B. Provide through-penetration fire stop systems with F ratings which shall equal or exceed the fire resistance rating of the penetrated building construction.

C. Provide through-penetration fire stop systems with T ratings, in addition to F ratings, at floors where the following conditions exist:
   1. Where fire stop systems protect penetrations located outside the wall cavities.
   2. Where fire stop systems protect penetrations located outside fire resistive shaft enclosures.
   3. Through-penetration fire stop systems protecting floor penetrations require a T-rating of at least 1 hour, but not less than the required floor fire-resistance rating.

D. Fire stop through-penetrations of floors, walls, partitions, ceilings, and roofs.

E. Fire stop through-penetration of partitions identified on the Construction Drawings as smoke partitions and fire rated assemblies.

F. Fire stop through-penetrations of floors, walls, partitions, ceilings, and roofs in accordance with the fire resistance rating assigned to the walls, partitions, floors, ceilings, and roofs on the Construction Drawings.

G. Provide fire stopping material and thickness as required to provide indicated ratings. Where not otherwise indicated, comply with UL standard designs. In multiple layer work, offset joints by at least 6". Anchor fire stopping using manufacturers' recommended system and in compliance with UL standard designs.

H. All sleeves installed to accommodate future work are to be sealed with properly supported safing insulation. Oversized box-outs, sleeves, and cores are to be filled with grout full depth of concrete with reinforcing, and other support as necessary to secure grout.

I. Permanently affix label at each fire stop. Use adhesive compatible with surface construction at fire stop location.

3.4 INSTALLATION OF JUNCTION, CONTROL, AND EXPANSION JOINT FIRE STOPS:

A. Use joint treatment materials to form fire stop to prevent the passage of flame and limit temperature rise of the unexposed surface, as detailed in the UL Fire Resistance Directory or the Factory Mutual Approval Guide.
   1. Where applicable design is not detailed in the Directories, use forming materials and fill, void or cavity material to form fire stop in accordance with approved printed details and installation instructions from the company producing the forming materials and fill, void or cavity material.

B. Fire stop junctures, control joints, and expansion joints.

C. Fire stop junctures, control joints, and expansion joints associated with smoke partitions and fire rated construction.

D. Permanently affix labels every 10 feet along each fire stop. Use adhesive compatible with surface construction at fire stop location.

3.5 CLEANING:

A. Clean off excess fill materials and sealants adjacent to penetrations by methods and cleaning materials recommended by manufacturers of fire stopping products and of products in which penetrations occur.

B. Remove masking tape as soon as practical so as not to disturb the fire stopping's bond with substrate.

C. Protect fire stopping during and after curing period from contact with contaminating substances, or damage resulting from adjacent Work.

D. Cut out and remove damaged or deteriorated fire stopping immediately, and install new materials as specified in fire stop schedule.

END OF SECTION 07 84 00

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PART 1 - GENERAL

1.1 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.

1.2 QUALITY ASSURANCE

A. Installer's Qualifications: The persons installing the sealants and their supervisor shall be personally experienced in the installation of sealants and shall have been regularly employed by a company engaged in the installation of sealants for a minimum of two years.
   1. Furnish to the Director the names and addresses of five similar projects which the foregoing people have worked on during the past two years.
   2. Furnish a letter from the sealant manufacturer, stating that the foregoing people are authorized to install the manufacturer's sealant materials and that the manufacturer's specifications are applicable to the requirements of this Project.

B. Container Labels: Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

C. Warranties:
   1. Silicone sealants: 20 years Weatherseal Warranty.
   2. Polyurethane or Silicone: 5 year Weatherseal Warranty.

1.3 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants at temperatures below 40 degrees F or above 85 degrees F for non silicone sealants and below minus 20 degrees F or above 125 degrees F for silicone sealants.
   2. Humidity and Moisture: Do not install the Work of this section under conditions that are detrimental to the application, curing, and performance of the materials.
   3. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.

B. Protection:
   1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
   2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved coverings to prevent defacement from droppings.

PART 2 - PRODUCTS

2.1 SELF-LEVELING POLYURETHANE SEALANT:

A. Provide two or more part, self-leveling, polyurethane based elastomeric sealant, complying with ASTM C920 Type M, Grade P, Class 25, having Shore A hardness of not less than 55 when tested according to ASTM D2240, cured modulus of elasticity at 100% elongation of not more than 150 psi when tested according to ASTM D412, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D 624. Provide one of the following products if they meet or exceed the requirements of these specifications:
   1. Pecora Urepan NR-200
   2. Tremco TAC 900
   3. Tremco 901
   4. Sika IA, SL

B. Where joint surfaces contain bituminous materials, provide modified sealers which are compatible with bituminous materials encountered.

C. Extent: Provide self leveling polyurethane sealant for all paving and floor joints not indicated to be sealed with another type of sealant.

2.2 SILICONE SEALANT (EXTERIOR):

A. Provide 795 by Dow Corning, 864 by Pecora, or Spectrem 2 by Tremco.

B. Extent: Provide non-sag silicone sealer for all, masonry to masonry joints, masonry to precast joints, precast to precast joints, precast to metal window joints, and other joints not indicated to be sealed with another type of sealer.
1. Double Sealant Joints: Unless otherwise indicated, provide double sealed joints at precast to precast joints, precast to metal joints and other joints as indicated. Weep from behind outer bead of sealer at regular intervals as approved by Architect.

C. Colors: Provide colors as selected by the Architect from manufacturer's standard colors.

2.3 SILICONE SEALANT (INTERIOR):

A. Provide one part, mold and mildew resistant, sanitary interior type silicone rubber based elastomeric sealant, complying with ASTM C 920 Type S, Class 25, Grade NS. Provide one of the following products if they meet or exceed the requirements of these specifications.
1. Dow 786
2. General Electric 1702
3. Pecora 863
4. Tremco Tremsil 200

B. Extent: Provide silicone rubber sealant for all interior joints in wet areas including around toilet room fixtures and control joints in work not on walking surfaces.

2.4 ACRYLIC LATEX SEALANT:

A. Provide permanently flexible, paintable latex rubber modified acrylic emulsion sealant, complying with ASTM C834. Provide one of the following products if they meet or exceed the requirements of these specifications:
1. Pecora AC-20
2. Sonneborne Sonolac
3. Tremco TremFiex 834

B. Extent: Provide acrylic latex sealer for use for exposed acoustical sealant, access doors before painting, and for all interior joints except where silicone rubber sealer is indicated.

C. At interior joints greater than 1/2 In. in width or subjected to periodic building movement, substitute exterior type sealant specified above.

D. Where surrounding wail surfaces are to be left unpainted, substitute exterior type sealant as specified above.

2.5 CONCEALED BEDDING SEALANT:

A. Provide: One-part butyl rubber sealant; Pecora's BC-158, PTI's 707, or Bostik's Chem-Calk 300.

2.6 JOINT FILLERS

A. Cork Joint Filler: Resilient, non-extruding type pre-molded cork units; ASTM D 1752, Type II.

B. Closed Cell Neoprene Joint Filler: ASTM D 1056, Class SC (oil resistant and medium swell), 2 to 5 psi compression deflection.

C. Expanded Polyethylene Joint Filler: Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).

2.7 MISCELLANEOUS MATERIALS

A. Joint Primer/Sealer/Conditioner: As recommended by the sealant manufacturer for the particular joint surface materials and conditions.

B. Backer Rod: Compressible rod stock of expanded, extruded polyethylene.

C. Bond Breaker Tape: Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self adhesive where applicable.

D. Cleaning Solvents: Oil free solvents as recommended by the sealant manufacturer. Do not use re-claimed solvents.

E. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.2 PREPARATION

A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.
   1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
   2. Remove lacquers, protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
   3. Do not limit cleaning of joint surfaces to solvent wiping. Use methods such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.

B. Set joint fillers at proper depth and position as required for installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between the ends of joint filler units.
   1. Smooth Edged Joints: For joints between two concrete slabs or where new concrete abuts smooth edged materials use either cork joint filler or closed cell polyurethane joint filler.
   2. Irregular Edged Joints: For joints where new concrete abuts granite curbs or other irregular edges use closed cell polyurethane joint filler.

C. Priming Joint Surfaces:
   1. As directed in manufcaturers' written instructions.
   2. Do not allow the primer/sealer to spill or migrate onto adjoining surfaces.

3.3 JOINT BACKING INSTALLATION

A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.

B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.4 SEALANT INSTALLATION

A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.

B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impractical, install sealant by knife or by pouring as applicable.

C. Finishing: Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.
   1. Use tool wetting agents as recommended by the sealant manufacturer.

3.5 FIELD QUALITY CONTROL

A. Test Samples:
   1. Where directed, for each 1000 linear feet of joint installed, cut out and carefully remove a 6 inch long sample of the undisturbed sealant and joint backer material from the newly installed Work. Remove the samples in the presence of the DAS Project Manager who will retain them for evaluating and testing.
   2. Reseal cut out areas with the same materials.

3.6 CLEANING

A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.

B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.

END OF SECTION 07 92 00

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Steel doors and frames, including hardware reinforcements; and accessories as shown in the contract documents.

1.2 REFERENCES:

A. ANSI- American National Standard Institute
   1. A240: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.
   2. A250.4-2001 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.

B. NAAMM National Association of Architectural Metal Manufacturers
   1. HMMA 830-1997 Hardware Preparations and Locations for Hollow Metal Doors and Frames.
   2. HMMA 831-1997 Recommended Hardware Locations for Hollow Metal Doors and Frames.
   3. HMMA 840-1999 Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.
   4. HMMA 861-2000 Guide Specification for Commercial Hollow Metal Doors and Frames.

1.3 DEFINITIONS:

A. Steel Door and Frame Manufacturer: Manufacturer of steel doors and frames regularly engaged in the manufacturing of such products for use in commercial, institutional, educational and other similar applications.

B. Company Field Advisor(s): An employee of the steel door and frame manufacturer who is certified in writing by the manufacturer to be technically qualified in design, installation, and servicing of products.

C. Steel Door and Frame Distributor: Distribution Company who regularly engages in the distribution of steel doors and frames of the manufacturer whose doors and frames are submitted for this project.

D. Certified Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in steel frame and door installation, and is certified in writing by the steel door and frame manufacturer as qualified and responsible to ensure approved steel frames and doors are installed, adjusted, and operate properly.

1.4 SUBMITTALS:

A. Waiver of Submittals: "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

B. Submittals Packages
   1. Door and Frame Schedule and Shop Drawings Package: Submit as a complete package. Incomplete packages will be returned unreviewed.
      a. Quality Assurance Submittal
         1) Certification of Compliance as described in the Quality Assurance Article.
         2) Company Field Advisor's Qualification Data
            a) Name of Company Field Advisor and Employer's name, business address and telephone number and e-mail address.
            b) Names and addresses of 3 similar projects Company Field Advisor has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer's letterhead that Company Field advisor is technically qualified in design, installation, and servicing of the products furnished for this Project.
         3) Certified Supervisor's and Installer's Qualification Data
            a) Name of Supervisor and each Installer performing Work, and Employer's name, business address and telephone number.
            b) Names and addresses of 3 similar projects Supervisor and each Installer has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer's letterhead that Supervisor/Installer is technically qualified to ensure approved steel frames and doors are installed, adjusted, and operate properly.

b. Door and Frame Schedule:
   1) Include a Cover Sheet that lists:
      a) DAS project name, project number, and project address.
      b) Manufacturer's name, address, and telephone number.
      c) Distributor's name, address, and telephone number.
      d) Shop drawing preparer's name, and telephone number and e-mail address.
      e) Submission date.
   2) List by opening
      a) Door and Frame number and location by building and room name. Use same reference numbers for openings and as those shown on Contract Drawings.
      b) Door width, height, thickness, type, gage, and options
      c) Frame type, width, height, jamb depth, gage, anchor type and options.
      d) Door and frame elevations; head and jamb profiles and details; welding requirements; and reinforcements.
      e) Fire Rating.
      f) Glass type.
      g) Undercut.
      h) Electric preparations, if any.
      i) Hardware Set.
      j) Show dimensioned elevations; construction details of each door including vertical and horizontal edge details; and frame details for each type, including dimensions profiles; locations for finish hardware, including cutouts and reinforcements; gage of reinforcements; details of connections; anchors and accessories; and details of conduit and preparations for electrified door hardware and controls.
   3) Product Data: Manufacturer's catalog sheets, specifications, and detailed installation instructions. Highlight products and options pertaining to this Project. Cross out information irrelevant to this Project.
   4) Manufacturer's Written Certification of Compliance that their products conform to the requirements of the references named in the References Article of this specification section, and as modified by this specification.
   5) Samples:
      a) Frames: Corner sample of each type, 18 x 18 inches, with mortises and reinforcements, factory primed or factory finished, as required.
      b) Doors: Corner sample of each type construction, 18 x 18 inches, with mortises and reinforcements, factory primed or factory finished, as required.

1.5 QUALITY ASSURANCE:

A. Uniformity and single source responsibility:
   1. Provide steel doors and frames from a single source manufacturer who specializes in this type of work.

B. Certification of Compliance: A statement, written on steel door and frame manufacturer's letterhead, that certifies their products, submitted for this Project, have been tested and comply with references named in the References Article of this specification section, and as modified by other requirements this specification.

C. Construction Verification: In order to determine if the products furnished comply with the specifications, the Director may choose one or more doors and frames for examination. The examination may involve cutting doors to expose the internal construction to inspect reinforcements, cores, welds and other construction details.

D. Field Measurements: Verify existing openings by field measurements before fabrication and indicate measurements on shop drawings.

E. Pre-installation Conference: When steel frames are on site, and before steel frame installation begins, the DAS Project Manager shall call a conference at the site to review the approved Steel Door and Frame Submittal, approved Finish Hardware Submittals, and proper installation procedures for the Work as well as:
   1. Pre-installation inspection of Doors and Frames
      a. Use and coordination of approved Steel Door and Frame submittals with approved Finish Hardware Submittals in the pre- installation inspection process
      b. Reading and understanding manufacturer's Door and Frame tags
      c. Inspection and verification of labeling and label placement

1) Specified fire labels (attached metal labels) on doors and frames,
2) Label locations
3) Label legibility

d. Inspection and verification of proper welding of frames
e. Inspection and verification of hardware reinforcement and preparations in frame head and jambs.
f. Inspection and verification of required anchors and fasteners.
g. Inspection and verification of glass kit preparations in doors
h. Inspection and verification of Electric hardware preparation in frames and doors

2. Review of maximum allowable clearances between frames and doors; doors and floor; and meeting stiles of doors, and verification methods.
3. Verification of plumb, square and level frame installation with jamb rabbets parallel to one another.
4. Review of proper frame installation tools.

The contractor, frame installers, certified Company Field Advisor, architect; and DAS inspector shall attend the conference. Facility personnel may attend.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. Deliver doors and frames in heavy paper cartons or other protective packaging.
Remove any plastic protective wrap from the package.

B. Store doors and frames under cover, in a dry area, on raised platforms in vertical position with minimum 4 inch blocking between units to allow air circulation.

C. Clearly label packaging, and doors and frames, for identification and installation location.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A1011/A1011M-04a 2004.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel complying with ASTM A1008/A1008M-04b 2004.

C. Galvannealed Steel Sheets: Zinc Iron Alloy-Coated carbon steel sheets of commercial quality complying with ASTM A 653/653M, with A 60 zinc coating.

D. Anchors and Supports: Fabricate of not less than 16 gage sheet steel unless otherwise indicated.
1. Galvanized Units: Galvanize anchors and supports to be used with galvanized frames, complying with ASTM A 153, Class B.

E. Anchorage Devices, Bolts, and Other Fasteners: Manufacturer's standard units unless otherwise indicated.
1. Galvanized Units: Galvanize items and comply with ASTM A 153, Class C or D as applicable.

F. Solid Block polyurethane core with minimum .07 U Factor.

G. Polystyrene slab with a minimum .24 U factor.

H. Extruded polystyrene rigid insulation.

2.2 DOORS:

A. General:
1. Design and Thickness: 2 outer stretcher-leveled steel sheets not less than 14 gage, seamless, steel channel stiffened construction, 1-3/4 inches thick.
2. Construct doors with smooth flush surfaces without visible joints or seams on exposed faces or stile edges, except around glass and louver panels. Continuously MIG, ARC or laser weld vertical edges full height of door, grind smooth, and dress to achieve seamless edge. Tack welded, putty filled edges are not acceptable.
3. Reinforce vertical edges by a continuous steel channel not less than 14ga extending the full height of door.
4. Close top and bottom of horizontal edges with 14 gage steel channel spot welded to the inside of the face sheets a maximum of 4 inches on center.

5. Continuously weld the closing end channels to the vertical edge reinforcing channel at all four corners producing a fully welded exterior.
6. Provide minimum 16 gage flush steel top and bottoms caps, notched at both ends to fit hinge and lock channels, installed with a minimum of 6 welds per cap. Grind welds, body fill and finish smooth.
7. Sound Deadening (ASTM E 90): Minimum Sound Transmission Class of 25.
8. Door Edges: Bevel lock stile edge of single acting hinged doors 1/8 inch in 2 inches. "V" bevel meeting stiles of pairs of doors, except at double egress locations where meeting stiles are parallel.
9. Glazing Stops and Beads: Fixed steel stops, formed integral with door on non-threat side of doors. Removable steel beads, of not less than 14 gage formed steel sheet or solid bar stock, on other side of doors secured with torx head machine screws. Form corners with butted hairline joints. Coordinate width of rabbet between fixed stop and removable bead, and depth of rabbet, with type of glass and glazing required.

C. Interior Doors:
1. 1-3/4" Thick 14 gage steel Attack Resistant Doors. Doors shall conform to the Steel Door Institute guide specification, ANSI A250 8.
2. Doors are made seamless style with hot- dipped galvanized steel conforming to ASTM A924 and A653. Doors have no visible seams on faces or vertical edges. Polystyrene core is securely bonded to both face sheets under pressure with contact adhesive. Foamed in place polyurethane chemically bonded to interior surfaces is also acceptable. The top and bottom door edges are closed with 14 gage steel channels welded to both face sheets. Doors to be provided with factory installed attach resistant glass, a scratch resistant laminated product consisting of glass with a custom security heat strengthened, chemically bonded core. Complies with ASTM C1036, ASTM C1172 and ANSI Z97.1 & UL 972.

2.3 FRAMES:

A. General:
1. Furnish steel frames for doors as shown, of size and profile as indicated.
2. Construction: Full welded unit construction, with corners mitered and continuously welded full depth and width of frame, unless otherwise specified or shown. Knock-down type frames will not be accepted.
   a. Fixed Stops: Integral 5/8 inch stop unless otherwise shown.
   b. Removable Beads: Removable steel beads secured with machine screws. Form corners with butted hairline joints.
3. Do not drill frames for silencers.
4. Weld steel shipping spreaders to the underside of the jamb legs, requiring removal of the spreaders prior to frame installation.

B. Interior and Exterior Frames: Attack resistant frames for 1-3/4" doors are welded type, formed from hot-dipped galvanized steel conforming to ASTM A924 and A653. Welded in jamb anchors are required.

C. Wall Anchors: Unless otherwise specified or shown, formed of not less than 16 gage galvannealed steel.
1. Masonry Construction: Adjustable, corrugated or perforated T-shaped to suit frame size with leg not less than 2 inches wide by 10 inches long. Furnish at least 3 anchors per jamb up to 7'6" jamb height; 4 anchors per jamb up to 8 foot jamb height; one additional anchor per jamb for each 24 inches or fraction thereof over 8 feet high.
2. Anchors for Completed Openings: Anchorage devices designed to secure frame to in-place concrete or in-place masonry construction, as applicable. Furnish at least 5 anchors per jamb up to 7'-6" jamb height; 6 anchors per jamb to 8 foot jamb height; one additional anchor per jamb for each 12 inches or fraction thereof over 8 feet high.

D. Floor Anchors: Furnish floor anchor for each jamb and mullion which extends to floor, formed of not less than 16 gage steel, with 2 holes to receive fasteners, welded to bottom of jamb or mullion, and galvanized if used with galvanized frames

2.4 FABRICATION:

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from warp, buckle and defects. Accurately form metal to required sizes and profiles, with minimum radius for thickness of

metal. Where practical, fit and assemble units in manufacturer's plant. To assure proper assembly at Project site, clearly identify items that cannot be permanently factory-assembled before shipment.

B. Exposed Fasteners: Countersunk flat, or oval head torx center pin screws and bolts. Unless otherwise indicated, locate fasteners 2 inches from ends of members and not more than 12 inches apart.

C. Finish Hardware Reinforcements:
1. Minimum 10 gage continuous reinforcement for continuous hinges.
2. Install 7 gage reinforcement for butt hinges, or hinge reinforcement in door edge may be one piece 12 gage channel full door height with extruded hinge screw holes having an average minimum thread pull-out strength of 1600 pounds per hole.
3. Minimum 12 gage reinforcement for other hardware.
4. Weld 14 gage steel tongues, 1-1/2 inches high, inside lock mortise to keep lock body centered in door.
5. Closer reinforce doors and provide full profile closer reinforcement in frames for full width of opening, whether or not closers are specified.

D. Finish Hardware Preparation:
1. Factory prepare doors and frames to receive mortised and concealed hardware, including cutouts; reinforcing; drilling and tapping, in accordance with approved Finish Hardware Schedule and templates furnished by hardware manufacturers.
2. Factory reinforced doors and frames to receive surface applied hardware. Drill and tap for surface applied hardware at project site.

E. Finish Hardware Locations: Locate hardware reinforcements and mortises so hardware locations comply with requirements of HMMA 831, “Recommended Hardware Locations for Custom Hollow Metal Doors and Frames”, and as follows:
1. Knobs, Levers, Crescents : Centerline 3’2” from finished floor.
2. Mortise Deadlocks: Centerline not to exceed 48” above finished floor.

F. Clearances: Fabricate doors for their respective frames within the following clearances:
1. Jambs and Head: 3/32 to 1/8 inch.
3. Bottom (no threshold): 3/4 inch, maximum to finished surface.
4. Bottom (at threshold): 3/8 inch, maximum to top of threshold or carpet.
5. Measure door clearances from stile edge to jamb.

G. Factory Prime Painting:
1. Chemically wash, rinse, and dry exposed and concealed surfaces of fabricated units.
2. Apply one coat of primer with vinyl binder to surfaces and oven-bake units.
3. Units shall be capable of passing the following tests:
   a. Salt Spray Test complying with ASTM B 117-97 for 120 continuous hours.
   b. Water Fog Test complying with ASTM D 1735-97 for 240 continuous hours.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verification of Conditions: Examine substrates, areas and conditions, with installer present under which frames are to be installed for defects that will adversely affect execution and quality of Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Prior to installation adjust and securely brace door frames for squareness, alignment, twist, and plumb to the following tolerances:
1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16”, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jamb face on a perpendicular line from head to floor.

B. Drill and tap doors and frames to receive non-templated mortised and surface mounted hardware.

3.3 INSTALLATION:

A. General: Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
   1. Frames: Install frame of size and profile indicated. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set.
      a) Remove temporary braces necessary for installation only after frames have been properly set and secured.
      b) Check plumb, squareness, and twist of frames as walls are constructed. Adjust as necessary to comply with installation tolerances.
   2. Installation Tolerances: Adjust door frames for squareness, alignment, twist, and plumb to the following tolerances:
      a) Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b) Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
      c) Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d) Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Doors: Fit non-fire-rated doors accurately in frames with the following clearances:
   1. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
   2. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
   3. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

3.4 ADJUSTING AND CLEANING:

A. Final Adjustments:
   1. Check and readjust operating hardware items immediately before final inspection.
   2. Leave work in complete and proper operating condition.
   3. Remove and replace defective work including doors or frames that are warped, bowed, or otherwise unacceptable.

B. Clean foreign materials off steel doors and frames immediately after installation.

3.5 FINAL INSPECTION:

A. Upon completion of the project, the DAS Project Manager will schedule a final inspection to verify doors and frames are properly installed and adjusted. The contractor, door and frame installer, and design representative will attend.

B. Upon verification, the design representative will certify in writing components are properly installed and adjusted within referenced tolerances in accordance with this specification. Include this certification in the Close-out Submittals.

END OF SECTION 08 11 02

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the Work of this Section.

1.2 DESCRIPTION OF WORK:

A. The Work of this Section includes, but is not limited to, the following:
   1. Access doors in walls and ceilings to provide access to chases, valves, controls and equipment.

1.3 RELATED WORK:

A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that relate directly to Work of this Section include, but are not limited to:
   1. Section 07 92 00, Joint Sealants
   2. Section 09 29 00, Gypsum Board
   3. Section 09 91 00, Painting
   4. Division 22, Plumbing
   5. Division 23, HVAC
   6. Division 26, Electrical

1.4 SUBMITTALS:

A. Product Data: Catalog sheets, specifications, and installation instructions.

1.5 QUALITY ASSURANCE:

A. Regulatory Requirements:
   1. Access Doors For Walls: Complete assemblies complying with Underwriter's Laboratories, Inc (UL) requirements. Ratings to match adjacent construction. Identify each assembly with UL label.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer’s instructions and recommendations. Protect from damage Sequence deliveries to avoid delays, but minimize on-site storage.

1.7 COORDINATION:

A. Conference: Convene a pre-installation conference to establish procedures to coordinate this work with related and adjacent work.

B. Coordination: Furnish inserts and anchors which must be built into other work. Work closely with installers of finish materials, so that access doors are aligned and installed flush with adjacent finishes.
   1. Exact location of access doors shall be approved by Architect prior to installation of work requiring access.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:
   1. Karp Associates, Inc.
   2. Meadowcraft, Inc.
   3. Milcor/Inyco

4. Nystrom, Inc.

2.2 MATERIALS AND PRODUCTS:

A. Provide each access door assembly manufactured as a complete unit, ready for installation with all necessary parts.

B. Sizes: Provide access doors of appropriate size for their intended use. Use manufacturer's standard sizes wherever possible.

C. Provide access doors that are full welded with welds ground flush and smooth and fabricated from sheet steel as follows:
1. Frames: Minimum 16 gage galvanized steel, with no exposed frame.
2. Flush Doors: Minimum 14 gage galvanized sheet steel with concealed continuous piano hinge set to open 175 degrees or concealed spring hinges on fire-rated doors.
3. Recessed Doors: Minimum 14 gage galvanized sheet steel designed with a 5/8" depth pan to receive a layer of drywall for a concealed appearance and concealed continuous piano hinge set to open 175 degrees or concealed spring hinges on fire-rated doors.
4. Where installed at fire-rated walls or ceilings access panels shall be of fire-resistive construction and shall bear the U.L. 2-hr. label.
5. Where installed in surfaces finished with ceramic tile or glazed coatings, access panels shall be ASTM A 666, Type 304 stainless steel with No. 4 finish.
6. Locks/Latches: Provide at least two screwdriver operated cam latches for each door to hold door in flush, smooth plane when closed. On fire-rated assemblies, provide manufacturer's standard self-latching, fire-rated devices. In public areas, such as toilet rooms, provide keyed cylinder locks with all doors keyed the same. Provide two keys for each locked access door.

2.3 FINISHES:

A. Factory Primed: Provide minimum 2.0 mil dry film thickness of rust inhibiting primer which is compatible with finish paint specified in Painting Section.

B. Stainless Steel Doors, where required, shall be provided with No. 4 Finish.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install the access doors in accordance with the Manufacturer's printed installation instructions, except as shown or specified otherwise.

B. Coordinate access door installation with installation of supporting construction.

C. Set units accurately in position and securely attach to supports with face panel plumb or level in relation to adjoining finish surface.

3.2 ADJUSTING, CLEANING AND PROTECTION:

A. Adjust operating parts to work easily, smoothly and correctly.

B. Touch-up damaged coatings and finishes to eliminate evidence or repair.

C. Repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.

D. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned.

END OF SECTION 08 31 00

PART 1 – GENERAL

1.1 SECTION INCLUDES:

A. Fixed curb mount unit skylight with formed curb counterflashing for mounting on prefabricated roof curbs, for flat, low-slope and steep-slope roofing applications.

1.2 RELATED REQUIREMENTS:

A. Section 061000 "Rough Carpentry" for site-built wood roof curbs for unit skylights.

B. Division 07 roofing section for flashing and roofing terminations at unit skylight curbs.

1.3 REFERENCE STANDARDS:

A. General: Applicable edition of references cited in this Section is current edition published on date of issue of Project specifications, unless otherwise required by building code in force.

B. American Architectural Manufacturers Association (www.aama.net), Window & Door Manufacturers Association (www.wdma.com), Canadian Standards Association (www.csagroup.org/us/en/services)

1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights (NAFS)
2. CSA A440S1-09 – Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440
3. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
4. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum and Panels

C. ASTM International: www.astm.org:
1. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
2. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings
3. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
4. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
5. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
6. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
7. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

D. Code of Federal Regulations:

1. 29 CFR 1910.23 (e) (8) - Occupational Safety and Health Standards for Walking-Working Surfaces to Guard Floor and Wall Openings and Holes

E. Illuminating Engineering Society of North America (IESNA): www.ies.org:

1. IESNA – The Lighting Handbook.

F. National Fenestration Rating Council: www.nfrccommunity.org:

1. NFRC 100 - Procedure for Determining Fenestration Product U-factors

2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

G. National Fire Protection Association: www.nfpa.org:

1. NFPA 70 - National Electrical Code

1.4 COORDINATION:

A. Coordinate dimensions, locations, and details of skylight curbs specified in Section 061000 "Rough Carpentry" with unit skylight curb flashings. Verify requirements for roofing system terminations.

B. Coordinate unit skylight interior termination locations with structural layout, ceiling grid layouts, and other ceiling-mounted items.

1.5 PREINSTALLATION MEETINGS:

A. Preinstallation Conference: Conduct conference at Project site prior to delivery of unit skylight and installation of roof deck.

1.6 ACTION SUBMITTALS:

A. Product Data: For unit skylights. Include standard construction details, product performance characteristics, and material descriptions, dimensions of individual components and profiles, and finishes.

1. Include test reports of qualified independent testing agency or third party certificates verifying compliance with performance requirements.

B. Shop Drawings: For unit skylight work. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.

1. Lighting photometric study indicating compliance with performance requirements in accordance with IESNA. Include layout, spacing criteria and foot-candle report.

1.7 INFORMATIONAL SUBMITTALS:

A. Warranty: Sample of special warranty.

1.8 CLOSEOUT SUBMITTALS:

A. Operation and Maintenance Data.

1.9 QUALITY ASSURANCE:

A. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum 30 years' experience in the US manufacturing similar products in successful use on similar projects and able to provide unit skylights meeting requirements.

1. Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Completed and signed Substitution Request form.
b. Product data, including photometric data and independent test data indicating compliance with requirements.
c. Sample product warranty.

1.10 WARRANTY:

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship under normal use within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of metals, metal finishes, dome, and other materials beyond normal weathering.
b. Breakage of glazing.

2. Warranty Period:

a. Unit Skylight and Flashing Product Warranty: 10 years from date of purchase.
b. Unit Skylight and Flashing Installation “No Leak” Warranty: 10 years from date of purchase.
c. Hail Breakage Warranty for Skylight Glass: 10 years from the date of purchase on all insulated glass units using laminated glass.
d. Insulating Glass Seal Failure Warranty: 20 years from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Basis-of-Design Product: Subject to compliance with requirements, provide products of **VELUX America Inc**., Greenwood, SC 29648; www.VELUXusa.com; (800) 878-3589, specifications@veluxusa.com.

B. Substitutions: As permitted under Instructions to Bidders and Section 012500 "Substitution Procedures".

C. Source Limitations: Obtain unit skylights through single source from single manufacturer.

2.2 FIXED CURB MOUNTED (FCM) UNIT SKYLIGHTS:

A. System Description: Fixed curb mounted unit skylight with a roll-formed aluminum frame counter-flashing joined by corner keys, an interior condensation drainage gasket, an insulated glass unit, structural sealant, mounting fasteners, flashing and accessories, as required to meet installation and performance requirements indicated. FCM skylights shall be suitable for installation on roof curbs ranging from 0 degrees up to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, Inc, Model FCM Fixed Curb Mount Skylight**.

B. Aluminum Frame Counter-flashing: Maintenance-free, roll-formed aluminum, 15 gauge, 0.06 inch (1.5 mm) thick with neutral grey Kynar® 500 polyvinylidene fluoride resin finish. Counter-flashing frames joined with neutral grey corner keys constructed from injection molded Acrylonitrile Styrene Acrylate (ASA)-Luran.

1. Unit Sizes: 2234.

C. Condensation Drainage Gasket: Factory applied black thermoplastic rubber gasket mounted around the entire interior aluminum frame assembly providing a thermal break weather seal and drainage for interior condensation.

D. Insulated Glass Unit: Factory assembled with low emissivity exterior pane and clear interior pane separated by a stainless steel spacer sealing the space between panes with 95% argon gas.

1. Exterior Pane: 0.125 inch (3mm) thick tempered glass with Neat® exterior coating and interior surface coated with three layers of low emissivity silver (LoE^3) coatings.

2. Interior Pane:

a. Laminated for wind-borne debris regions, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.090 inch (2.3 mm) clear [polyvinyl butyral] [Sentryglasplus®] interlayer sandwiched together.

E. Structural Sealant: Factory applied silicone sealant, black color, bonding the glass pane to the aluminum frame and suitable for external exposure.

F. Mounting Fasteners: #8 x 1.75 inch (44 mm) stainless steel, black zinc coated, self-drilling screws provided with skylight. [12] [14] [20] field installed screws secures skylight to site built curb as indicated in manufacturer's installation instructions.

2.3 FLASHINGS:

A. High Profile Flashing: Roll formed aluminum, neutral grey finish, factory engineered and fabricated seams, consisting of head flashing, sill flashing, side gutter pieces, counter flashing and adhesive underlayment suitable for use with 4 inch (100 mm) and 6 inch (150 mm) curbs on roof pitches 14 to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, Inc, ECW High Profile Flashing.**
2. Size: As required for skylight sizes indicated.
3. Material:
   a. Head flashing 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
   b. Sill flashing 22 gauge (0.65 mm) thick aluminum with Kynar 500 finish and 9 inch (229 mm) pleated apron.
   c. Side gutter pieces 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
   d. Counter-flashing 23 gauge (0.57 mm) thick with 4 inch (100 mm) curb counter flashing, aluminum with polyester lacquer finish.
   e. Adhesive underlayment: 12 inches (305 mm) width x 21 feet (6.4 m) length x 0.03 inch (0.8 mm) thickness, SBS modified bitumen with white polyethylene backing sheet.

2.4 MATERIALS:

A. Aluminum Sheet: Flat sheet complying with ASTM B 209/B 209M.

B. Joint Sealants: As specified in Section 079200 "Joint Sealants."

C. Mastic Sealants: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.5 FINISHES:

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with unit skylight installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Install unit skylights in accordance with manufacturer's written instructions and approved shop drawings. Coordinate installation of units with installation of substrates, air and vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that finished installation is weather tight.

1. Anchor unit skylights securely to supporting substrates.
2. Install unit skylights on curbs specified in another section with tops of curbs parallel to finished roof slope.

B. Where metal surfaces of unit skylights will contact incompatible metal or corrosive substrates, including preservative-treated wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation recommended in writing by unit skylight manufacturer.

C. For custom flashings, install unit skylight curb counter-flashing to produce weatherproof seal with curb and overlap with roofing system termination at top of curb.

3.3 CLEANING AND PROTECTION:

A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

B. Replace glazing that has been damaged during construction period.

C. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION 08 62 00

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the Work of this Section.

1.2 DESCRIPTION OF WORK:

A. This section specifies finish hardware for interior and exterior doors to provide correct functions for intended use. Provide related items and services, as indicated on Drawings and as specified. Furnish hardware schedules and templates as required for fabrication of doors and frames under other Sections. Provide hardware that complies with applicable codes and requirements of authorities that have jurisdiction.
   1. Coordinate Work of this Section with requirements of building security system.

1.3 RELATED WORK:

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:
   1. Section 08 11 02, Steel Doors and Frames

1.4 SUBMITTALS:

A. Hardware Schedule: Provide six copies of final hardware and keying schedule prepared by a DHI certified hardware consultant or distributor. List each door opening using same designations indicated on Architect's Drawings.

B. Installation Templates: Provide installation templates for work installed or prepared for installation by others.

C. Product Data: Submit manufacturer's product data, catalog cuts, descriptive data, UL listings, and other pertinent technical data for each hardware item used. Submit certifications of fire-ratings for hardware items located in rated assemblies.

D. Samples: Submit samples of each finish to be exposed. Show full range of color and finish variations expected.
   1. Submit actual finished items of hardware when directed by Architect. Acceptable items may be used in the completed work.

1.5 QUALITY ASSURANCE:

A. Source: For each type of hardware required for the work of this Section, provide products of a single manufacturer.

B. Consultant: Provide the services of a certified hardware consultant, acceptable to the Architect, to prepare hardware and keying schedules and to certify that the work of this Section meets or exceeds requirements of authorities having jurisdiction.

C. Comply with American with Disabilities Act Accessibility Guidelines (ADAAG) and applicable local requirements.

1.6 TESTS:

A. Fire-Resistance Ratings: When fire-resistance ratings are indicated or required by authorities having jurisdiction, provide hardware items identical to those which have been tested and labeled for fire-rated use by independent testing agencies acceptable to Architect.

1.7 DELIVERY, STORAGE AND HANDLING:

A. Packaging: Package and label each hardware item separately with all screws, bolts and accessories required for a complete and proper installation. Coordinate the labeling of packages with hardware set numbers.

B. Store hardware items in locked spaces. Replace all hardware items lost or damaged. Provide copies of supplier receipts for hardware items delivered to the Project.

PART 2 - PRODUCTS

2.1 BUILDERS HARDWARE - GENERAL REQUIREMENTS:

A. Provide the specified hardware item, or an equal product from one of the other named manufacturers which meet or exceed the standard as judged by the Architect.

B. Provide the proper hardware which permits the swing and hand of each door as indicated on the Drawings.

C. Manufacturer's names or trademarks displayed in a visible location will not be permitted on any piece of hardware.

D. Base Metal: Provide plated brass or bronze with the exception of stainless steel and aluminum items.

E Fasteners: Provide concealed fasteners to the greatest extent possible. Do not use through-bolts unless otherwise acceptable to the Architect.

F. Coordinate items to be provided by the owner’s security vendor prior to generating the hardware schedule.

2.2 HARDWARE FINISHES:

A. Provide US32D.

B. Closer Covers: Provide plated metal closer covers matching lock and latch finishes.

2.3 KEY CONTROL SYSTEM:

A. Provide key control system consisting of labels, tags, card index, and metal wall mounted cabinet. Set up control system, label and identify each key, type index cards, and deliver to Owner complete and ready for use.

2.4 HINGES:

A. Continuous Hinges shall be as follows
   1. Zero 919 STST x HT x marked “Top” x torx with center security pin x 630..

B. Size of Hinges shall be as follows:
   1. Height 5” for doors over 7’6” in height.
   2. Height 4 ½” for interior doors under 7’6” in height.

C. Hinge Width: Consultant shall determine proper hinge width based upon door thickness and trim conditions. Provide minimum 4-1/2 in. wide hinges.

D. Hinge Quantity: Provide three (1 ½ pair) hinges for doors up to 7 ft.-6 in. high, and four (2 pair) hinges for doors over 7’-6” high. Provide one additional hinge for doors over 3 ft.-6 in. wide.

E. Pins: Provide flat button pins matching hinges in finish and material. Provide non-removable pins on outswinging exterior and corridor doors. Provide non-rising pins for all other hinges.

2.5 LOCKSETS AND LATCHSETS:

A. Mortise Locksets and Latchsets: Except where scheduled otherwise, provide latchsets and locks with lever and rose as selected by Architect by one of the manufacturers listed below. Provide cylinders and keyway to Owner's requirements.
1. Corbin Russwin

B. Locksets shall be Corbin Russwin lever handle type heavy duty cylindrical. Function of lockset shall be as noted in the Schedule.
1. Corbin Russwin ML2022 x YWM x curved lip strike x wrought box x torx with center security pin x 630.with Vandal Resistant trim.
Handle – Newport

C. Throws: Provide ½" minimum. Comply with UL requirements for fire rated hardware.

D. Strikes: Provide manufacturer's standard box strike with extended curved lip. Finish strikes and lips to match lock or latch. Provide custom strikes where required.

E. Metals: Provide cylinders and keys from brass matching type and finish of metal for hardware.

2.6 LATCH PROTECTOR:

A. Provide products of one of the following manufacturers that meet or exceed the requirements specified:
1. Don-Jo Mfg, Inc.

B. Latch Protector:
1. PLP 111 3" x 11"
12 Ga. Stainless Steel
Finish: US32D

2.7 CLOSER:

A. Provide : LCN 4213 x SRI x thru-bolt x torx with center security pin x AL

2.8 KICK PLATE:

A. Provide : Rockwood K1062 10" x 1 ½" LDW x B4E x torx with center security pin x 630

2.9 WALL STOP:

A. Provide : Rockwood 400/402 as required x torx with center security pin x 626

2.10 WEATHERSTRIPPING AND THRESHOLDS:

A. Provide products of one of the following manufacturers that meet or exceed the requirements specified:
1. Reese
2. Pemko
3. Zero

B. Thresholds for General Applications: Refer to schedule for material.

C. Weather-stripping: Provide neoprene concealed gasket-type weather-stripping at exterior doors. Weather-stripped doors are required to provide a continuous seal at the entire perimeter of door with no cracks.

2.11 MISCELLANEOUS HARDWARE:

A. Silencers: For interior hollow metal frames, provide gray resilient silencers to suit frame type. Provide three silencers for single doors, and two silencers for doors hinged in pairs

PART 3 - EXECUTION

3.1 INSPECTION:

A. Examine doors, frames and conditions under which the work of this Section will be performed. Notify Contractor in writing of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Commencing work means Installer accepts substrates and conditions.

3.2. INSTALLATION:

A. Comply with manufacturers' instructions and recommendations, except where more restrictive requirements are specified in this Section.

B. Install hardware on doors and frames at locations conforming to ANSI and NAHM standards, and DHI mounting heights, except where specifically indicated otherwise or required by authorities having jurisdiction.

C. Set hardware plumb, level, and in exact alignment and location. Conceal and countersink fasteners wherever possible.

D. Set exterior thresholds in bed of sealant provided under Section 07 92 00, Joint Sealants.

3.3 ADJUSTING, CLEANING, AND PROTECTION:

A. Adjust hardware items to work smoothly, easily, and correctly.

B. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of hardware being cleaned. Remove and replace work which cannot be successfully cleaned, as judged solely by the Architect.

C. Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protections and reclean as necessary immediately prior to final acceptance.
   1. Cover knobs, levers, pulls, and push plates with heavy cloth to protect against damage until Final Acceptance of the Project.

3.4 COMPLETION AND CONTINUED MAINTENANCE:

A. Before completion of work of this Section, inspect work with Architect and adjust and correct work to leave operating parts in perfect operating condition, jointing to adjacent material tight, surfaces without blemishes or stains, work properly executed and complete, and defects and damaged work replaced or corrected.

B. Provide services of hardware supplier's representative to inspect hardware six months after Final Acceptance of Project. Readjust and restore hardware.

3.5 HARDWARE SETS:

A. The Hardware sets listed indicate the items of hardware required for one opening, single door or pair of doors. This information is furnished for use as a guide only. It is the hardware supplier's responsibility to furnish the proper quantities, functions, weights, and sizes as required by the specifications and as recommended by the manufacturer's catalogue information.
   1 Refer to Door Schedule for Hardware sets.

END OF SECTION 08 70 00

PART 1 - GENERAL

1.2 REFERENCES:

A. Comply with recommendations in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown or specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

1.3 SUBMITTALS:

A. Product Data: Manufacturer's specifications and installation instructions for each type of glass and glazing material specified, and spacers and compressible filler rod.

B. Samples:
   1. Glass: 12 x 12 inch pieces for each type of glass specified.

C. Quality Control Submittals:
   1. Test Reports: Certified test data to sufficiently substantiate glass or glass assembly compliance with requirements specified.
   2. Certificates:
      a. Affidavit required under Quality Assurance Article.

1.4 QUALITY ASSURANCE:

A. Compatibility of Materials: All components of the glazing system shall be manufactured or recommended by one manufacturer to assure the compatibility of materials.

B. Safety Glazing Material: Type indicated, meeting requirements of ANSI Z97.1 with label on each piece.

C. Certification:
   1. Affidavit by the material supplier, certifying type and quality of glass furnished.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Protect glass from edge damage during handling, storage, and installation.

1.6 PROJECT CONDITIONS:

A. Environmental Requirements: Comply with glazing materials manufacturer's written recommendations regarding environmental conditions under which glazing materials can be installed.

B. Glazing channel dimensions shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate glazing material thicknesses, with reasonable tolerances. Provide correct glass size for each opening, within the tolerances and necessary dimensions required.

PART 2 - PRODUCTS

2.1 GLASS:

A. Type I Glass: Laminated Safety Glass; two sheets of double-strength clear sheet glass; ASTM C 1036, Type I, Class 1, quality q3; permanently laminated together with a minimum 0.030 inch thick sheet of clear plasticized polyvinyl butyral, which has been produced specifically for laminating glass.
   1. Temper both panes of glass in each unit.

2.2 GLAZING MATERIALS:

A. Type 1 Glazing Material: Silicone Rubber Glazing Sealant; silicone rubber one-part elastomeric sealant; FS TT-S-001543, Class A; acid-type for non-porous channel surfaces, and non-acid type where any of the channel surfaces are porous.

B. Colors: For exposed materials provide color as indicated or, if not indicated, as selected by the Director from the manufacturer's standard colors. For concealed materials, provide any of the manufacturer's standard colors.

C. Setting Blocks: Neoprene, 70-90 durometer hardness, with proven compatibility with sealants used.

D. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with glazing materials used.

E. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

F. Cleaners, Primers and Sealers: Type recommended by glazing material manufacturer.

PART 3 EXECUTION

3.1 PREPARATION:

A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.

B. Inspect each piece of glass immediately before installation, and eliminate pieces which have observable damage or face imperfections.

C. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.2 INSTALLATION:

A. Each installation shall withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.

B. Install glass in accordance with the standards detailed in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

C. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.

D. Install glazing materials in accordance with the manufacturer's printed instructions.

3.3 GLAZING:

A. Install setting blocks of proper size at quarter points of sill rabbet. If required to keep in place set blocks in thin course of the heel-bead compound.

B. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light sizes, thickness and type of glass, and complying with manufacturer's recommendations.

D. Do not cut, seam, nip, or abrade glass which is tempered, heat strengthened, or coated.

E. Force glazing materials into channel to eliminate voids and to ensure complete "wetting" or bond of glazing material to glass and channel surfaces.

F. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

G. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.

H. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

3.4 CURE, PROTECTION AND CLEANING:

A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.

B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

C. Replace glass included in the work which is broken, or otherwise damaged, from the time Work is started at the site until the date of physical completion.

D. Maintain glass in a reasonably clean condition until date of physical completion.
1. Clean and trim excess glazing material from the glass and stops or frames promptly after installation.

E. When directed, or just before the project is turned over to the State, remove dirt and other foreign material and wash and polish glass included in the work on both sides.

END OF SECTION 08 81 00

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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 Kawneer Architectural Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.
   1. Types of aluminum windows include:
      a. Kawneer Series AA™4325 Ultra Thermal
      b. Project-Out Windows
      c. 3-1/4" (82.5 mm) frame depth
      d. Architectural Window Grade AW-PG80-AP

B. Related Sections:
   1. Division 078466 “Fire-Resistant Joint systems” for fire resistive material installed between aluminum sliding door system and floor intersections
   2. Division 079200 “Joint Sealants” for joint sealants installed as part of the aluminum sliding door system
   3. Division 084113 "Aluminum-Framed Entrances"
   4. Division 084413 "Glazed Aluminum Curtain Walls"

1.3 DEFINITIONS:

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 PERFORMANCE REQUIREMENTS:

A. General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction.

   1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.

B. Window Performance Requirements:
   1. Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) when tests are performed on a 36" x 60" minimum frame size with the following test results:
      a. Performance Class and Grade: AW-PG80-AP
   2. Air Infiltration: after the AAMA 910-10 life cycle test, meet AAMA 101 standard of maximum .1 cfm/square foot when tested per ASTM E 283-04 at a static air pressure difference of 6.24 psf.
   3. Water Penetration: after the AAMA 910-10 life cycle test, no uncontrolled water leakage when tested per ASTM E 547-00 and ASTM E 331-00 at a static air pressure difference of 15 psf.
   4. Uniform Deflection: no more than L/175 when tested per ASTM E 330-02 at a static air pressure difference of 80 psf.
   5. Uniform Structural: window to be operable, and maximum .2% permanent deformation per member when tested per ASTM E 330-02 at a static air pressure difference of 120 psf.
   6. Component Testing: Window components shall be tested in accordance with procedures described in ANSI AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
   7. Condensation Resistance Test (CRF): When tested in accordance with AAMA 1503, the condensation resistance factor (CRF) shall not be less than:

a. 1" insulating glass made with exterior 1/4" soft coat low E glass, thermoplastic butyl spacer, argon gas, and interior 1/4" clear glass:
(CRF_f) frame not less than 70.
(CRF_g) glass not less than 66.

b. 1-3/4" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass:
(CRF_f) frame not less than 76.
(CRF_g) glass not less than 79.

8. Condensation Resistance (I): When tested to CSA A-440, the condensation index shall not be less than:

a. 1" insulating glass made with exterior 1/4" soft coat low E glass, thermoplastic butyl spacer, argon gas, and interior 1/4" clear glass:
Temperature Index (I_f) frame not less than 63.
Temperature Index (I_g) glass not less than 67.

b. 1-3/4" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass:
Temperature Index (I_f) frame not less than 68.
Temperature Index (I_g) glass not less than 79.

9. Thermal Transmittance Test (U-Factor): When tested in accordance with AAMA 1503, the conductive thermal transmittance (U-Factor) shall not be more than:

a. 1" insulating glass made with exterior 1/4" soft coat low E glass, thermoplastic butyl spacer, argon gas, and interior 1/4" clear glass:
U-Factor not more than .44 BTU/hr/sf/°F or ____ BTU/hr/sf/°F per AAMA 507 or NFRC100 when using project specified glass.

b. 1-3/4" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass:
U-Factor not more than .27 BTU/hr/sf/°F or ____ BTU/hr/sf/°F per AAMA 507 or NFRC100 when using project specified glass.

10. Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.

11. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:

a. 1" insulating glass made with exterior 1/4" soft coat low E glass, thermoplastic butyl spacer, argon gas, and interior 1/4" clear glass:
33 (STC) and 26 (OITC).

b. 1-3/4" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass:
32 (STC) and 25 (OITC)

12. Thermal Barrier Tests: Testing shall be in general accordance with AAMA 505 Dry Shrinkage and Composite Thermal Cycling test procedure, AAMA TIR-A8, Structural Performance of Composite Thermal Barrier systems.

1.5 SUBMITTALS:

A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.

C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.

D. Samples for Verification: For aluminum windows and components required.

E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.

1.6 QUALITY ASSURANCE:

A. Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS:

A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY:

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.

B. Windows: warrant for two years against defects in material or workmanship under normal use.

C. Insulating glass units: warrant seal for five years against visual obstruction from film formation or moisture collection between internal glass surfaces, excluding that caused by glass breakage or abuse.

D. Paint finish: PPG…
   1. Permafluor™ organic finish conforming to AAMA 2605-05: warrant for ten years against chipping, peeling, cracking, chalking, or fading.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Basis-of-Design Product:
   1. Kawneer Series AA^{TM}4325 Ultra Thermal

2. Project-Out Windows
3. 3-1/4" (82.5 mm) frame depth
4. Architectural Window Grade AW-PG80-AP

B. Subject to compliance with requirements, provide a comparable product by the following:
1. EFCO
2. Oldcastle

C. Substitutions: Refer to Substitutions Section for procedures and submission requirements.
1. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
2. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid window installation and construction delays.
3. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
4. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)
5. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
6. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

D. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIALS:

A. Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish.

B. Thermal Barrier: Structural thermal break made with glass-reinforced nylon strips, (closed cell PVC foam strips) installed by the window manufacturer in the frame and vent members.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.3 WINDOW SYSTEM:

A. Series AA^{TM}4325 Ultral Thermal Project-Out Windows.

2.4 GLAZING:

A. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.

B. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer’s standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

C. Glazing: Exterior extruded silicone gasket with 2-part structural silicone; 1" insulating glass; Interior aluminum glazing bead; open cell foam encased in black thermoplastic elastomeric (TPE) gasket; glass description in paragraph 2.4; glazed by the window manufacturer.

2.5 HARDWARE:

A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.

B. Projected Window Typical Hardware:

C. Typical Hardware:
1. Locking
   a. Cast White Bronze Cam Locks (Standard)
   b. Single Handle Multi-Point Locks
   c. Access Control Locks
2. Hinging
   a. 4-Bar Hinges (Standard)
   b. Limit Stop
   c. Butt Hinges
   d. Friction Adjusters
3. Other
   a. Roto Operator

2.6 ACCESSORIES:

A. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

B. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

C. Sealants and joint fillers for joints at perimeter of window system as specified in Division 7 Section "Joint Sealants".

D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

E. Muntins:
1. Material: extruded aluminum or roll-formed aluminum; with exposed surfaces finished to match window exterior and interior colors; concealed fasteners; designed for unrestricted expansion and contraction.
2. Design: muntin bar cross-section profile and material chosen from manufacturer’s standards.
3. Patterns: grid patterns to be designated by architect.
4. Locations:
   a. Exterior and Interior.
   b. Internal: (Encapsulated between the two glass lites in the insulating glass unit to protect them from damage and dirt buildup).

F. Glazing: Factory glazing as required and specified in Division 8 Section “Glazing”.

G. Accessories:
1. Material: extruded aluminum; nominal .062" (1.57 mm) wall; with exposed surfaces finished to match window color and finish performance; concealed fasteners; required weatherseals; designed for unrestricted expansion and contraction.
2. Exterior: (wrap around panning;) (preset panning;) (two-piece mullion cover;) (two-piece head and jamb receptor with thermal break;) (subsill with thermal break and end dams sealed by the window manufacturer;) (sill cover;) (slip-on expanders).

3. Interior: (two-piece snap trim;) (stool cover).
4. Mullions: with thermal break; (integral: mounted between frame members;) (stack;) (offset stack;) (three-piece).

H. Insect Screens: full; field-mounted on interior with steel spring clips; handle-access wickets; 3/4" x 1-1/8" x .050" extruded tubular aluminum frame with finish to match window in color and performance; corners mitered, gusset reinforced, and crimped; 18 x 16 dark fiberglass [aluminum] mesh; PVC spline.)

2.7 FABRICATION:

A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fit joints; make joints flush, hairline and weatherproof.
3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
4. Physical and thermal isolation of glazing from framing members.
5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
6. Provisions for field replacement of glazing.
7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

B. Frame and Vent: All members double tubular; corners mitered, double gusset reinforced, factory-sealed with sealant conforming to AAMA 800-07, and crimped.

C. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

D. Fabricate aluminum windows that are re-glazable without dismantling sash or framing.

E. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
1. Structural thermal break made with glass-reinforced nylon strips, (closed cell PVC foam strips) installed by the window manufacturer in the frame and vent members.

F. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

G. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.

H. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

I. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match frame.

2.8 ALUMINUM FINISHES:

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing:
1. Kawneer Permanodic™ AA-M10C22A31, AAMA 611, Architectural Class II Clear Anodic Coating, Color #17 Clear.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
   1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
   2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
   3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

B. Install aluminum framed window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

D. Install aluminum framed window system and components to drain condensation, water penetrating joints, and moisture migrating within system to the exterior.

E. Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

3.3 FIELD QUALITY CONTROL:

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
   1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
   1. Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
      a. Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
      b. Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
   2. Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
   3. Test Reports: Shall be prepared according to AAMA 502.

3.4 ADJUSTING, CLEANING, AND PROTECTION:

A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

C. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION

PART 1 GENERAL

1.1 Summary

A. Furnish and install louvers, bird screens, blank-off panels, structural supports and attachment brackets as shown on the drawings, as specified, and as needed for a complete and proper installation.

B. The louvers to be furnished include the following:
   1. Drainable fixed extruded louvers.

C. Related sections include:
   1. Division 7 Section "Joint Sealants" for sealants installed in perimeter joints between louver frames and adjoining construction.

1.2 References

A. Air Movement and Control Association International, Inc.
   1. AMCA Standard 500-L Laboratory Methods of Testing Louvers for Rating
   2. AMCA Publication 501 Application Manual for Louvers

B. The Aluminum Association Incorporated
   1. Aluminum Standards and Data
   2. Specifications and Guidelines for Aluminum Structures

C. American Society of Civil Engineers
   1. Minimum Design Loads for Buildings and Other Structures

D. American Society for Testing and Materials
   1. ASTM B209
   2. ASTM B211
   3. ASTM B221
   4. ASTM E90-90

E. Architectural Aluminum Manufacturers Association
   1. AAMA 800 Voluntary Specifications and Test Methods for Sealants
   2. AAMA 605.2 Voluntary Specification for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA TIR Metal Curtain Wall Fasteners
   4. AAMA 2605-98 Superior Performing Organic Coatings on Aluminum Extrusions and Panels

F. Canadian Standards Association
   1. CAN3-S157-M83 Strength Design in Aluminum
   2. S136 94 Cold Formed Steel Structural Members

1.3 Submittals

A. Product Data
   1. Air flow and water entrainment performance test results.
   2. Material types and thickness.

B. Shop Drawings
   1. Include elevations, sections and specific details for each louver.
   2. Show
   3. anchorage details and connections for all component parts.
   4. Include signed and sealed structural calculations.

C. Samples

D. Submit color chips for approval.

1.4 Quality Assurance

A. Single subcontract responsibility: Subcontract the work to a single firm that has had not less than six years experience in the design and manufacturing of work similar to that shown and required.

B. Performance Requirements: Provide AMCA and BSRIA test data as required to confirm that the louvers have the specified air and water performance characteristics.

C. Acoustical Performance: Where applicable, submit test reports to confirm that the louvers meet the specified STC and Noise Reduction requirements.

D. Structural Requirements: Design all materials to withstand wind and snow loads as required by the applicable building code. Maximum allowable deflection for the louver structural members to be l/180 or 0.75 inch, whichever is less. Maximum allowable deflection for the louver blades to be l/120 or 0.50 inch across the weak axis, whichever is less.

E. Professional Engineer Requirements: Drawings and structural calculations to be signed and sealed by a professional engineer licensed to practice in the project state.

F. Warranty: Provide written warranty to the owner that all products will be free of defective materials or workmanship for a period of one year from date of installation.

1.5 Delivery, Storage and Handling

A. Delivery: At the time of delivery all materials shall be visually inspected for damage. Any damaged boxes, crates, louver sections, etc. shall be noted on the receiving ticket and immediately reported to the shipping company and the material manufacturer.

B. Storage:
1. Material may be stored flat, on end or on its side.
2. Material may be stored either indoors or outdoors.
3. If stored outdoors the material must be raised sufficiently off the ground to prevent it being flooded.
4. If stored out doors the material must be covered with a weather proof flame resistant sheeting or tarpaulin.

C. Handling:
1. Material shall be handled in accordance with sound material handling practices and in such a way as to minimize racking.
2. Louver sections may be hoisted by attaching straps to the jambs and lifting the section while it is in a vertical position.
3. Louver sections should only be lifted and carried by the jambs. Heads, sills and blades are not to be used for lifting or hoisting louver sections.

PART 2 PRODUCTS

2.1 Manufacturers

A. The louvers and related materials herein specified and indicated on the drawings shall be as manufactured by:
Construction Specialties, Inc.
49 Meeker Avenue
Cranford, New Jersey 07016
Telephone: 800-631-7379

B. Products equal to the CS materials may be offered providing that the manufacturer and materials are pre-approved at least 10 working days before the bid date.

2.2 Materials

A. Aluminum Extrusions: ASTM B211, Alloy 6063-T5, 6063-T6 or 6061-T6.
B. Aluminum Sheet: ASTM B3209, Alloy 1100, 3003 or 5005.

2.3 Fabrication, General

A. Provide CS louver models, bird screens, blank-off panels, structural supports and accessories as specified and/or shown on the drawings. Materials, sizes, depths, arrangements and material thickness to be as indicated or as required for optimal performance with respect to strength; durability; and uniform appearance.
B. Louvers to be mechanically assembled using stainless steel or aluminum fasteners.
C. Include supports, anchorage, and accessories required for complete assembly.

2.4 Louver Models

A. **CS 4" (101.6mm) High Performance Drainable Fixed Mullion Louver Model A4177**

1. **Material:** Heads, sills, jambs and mullions to be one piece structural aluminum members with integral caulking slot and retaining beads. Mullions shall be sliding interlock with internal drains. Blades to be one piece aluminum extrusions with gutters designed to catch and direct water to jamb and mullion drains. Compression gaskets shall be provided between bottom of mullion or jamb and top of sill to insure leak tight connections. Material thickness to be as follows: Heads: 0.070" (1.78mm), Sills: 0.080" (2.03mm), jambs and mullions: 0.125" (3.18mm), fixed blades: 0.070" (1.78mm).

2. **AMCA Performance**: A 4' x 4' unit shall conform to the following and be licensed to bear the AMCA seal:

Free Area	8.80 sq. ft. (0.82 sq. m.)
Free area velocity at the point of beginning water penetration	1087 FPM (5.52 m/s)
Intake Pressure drop at the point of beginning water penetration	0.18 in. H_2O (44.7 Pa)
Exhaust Pressure drop at the point of beginning water penetration	0.15n. H_2O (38.2 Pa)

2.5 Finishes

A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations, except as otherwise indicated. Apply finishes in factory. Protect finishes on exposed surfaces prior to shipment. Remove scratches and blemishes from exposed surfaces that will be visible after completing finishing process. Provide color as indicated or, if not otherwise indicated, as selected by architect.

B. 100% Fluoropolymer Resin Powder Coat System complying with AAMA-2605-5 standards for gloss and color retention. Finish thickness to be 1.5 to 3.0 mils.
   1. Finish to allow zero VOCs to be emitted into facility of application or at job site.
   2. Finish to adhere to a 4H Hardness rating.
   3. Furnish manufacturer's twenty (20) year warranty for finish for gloss and color retention

2.6 Bird Screens

A. Unless otherwise indicated, all louvers to be furnished with mill finish bird or insect screens.

B. Screens to be 5/8” (15.9mm) mesh, 0.050” (1.27mm) thick expanded and flattened aluminum bird screen secured within 0.055” (1.40mm) thick extruded aluminum frames. Frames to have mitered corners and corner locks.

2.7 Blank Offs

A. Furnish where indicated on the drawings blank–off panels fabricated by the louver manufacturer.

B. Blank-off panels to be 0.050” (1.27mm) thick aluminum sheet. Panels to be finished with Kynar 500 minimum 1 mil (0.025mm) thick full strength 70% resin Fluoropolymer coating. Color to be selected by the architect.

PART 3 EXECUTION

3.1 Examination: Examine openings to receive the work. Do not proceed until any unsatisfactory conditions have been corrected.

3.2 Installation

A. Comply with manufacturer's instructions and recommendations for installation of the work.

B. Verify dimensions of supporting structure at the site by accurate field measurements so that the work will be accurately designed, fabricated and fitted to the structure.

C. Anchor louvers to the building substructure as indicated on architectural drawings.

D. Erection Tolerances:
   1. Maximum variation from plane or location shown on the approved shop drawings: 1/8" per 12 feet of length, but not exceeding 1/2" in any total building length or portion thereof (non-cumulative).
   2. Maximum offset from true alignment between two members abutting end to end, edge-to-edge in line or separated by less than 3": 1/16" (shop or field joints). This limiting condition shall prevail under both load and no load conditions.

E. Cut and trim component parts during erection only with the approval of the manufacturer or fabricator, and in accordance with his recommendations. Restore finish completely. Remove and replace members where cutting and trimming has impaired the strength or appearance of the assembly.

F. Do not erect warped, bowed, deformed or otherwise damaged or defaced members. Remove and replace any members damaged in the erection process as directed.

G. Set units level, plumb and true to line, with uniform joints.

3.3 Protection

A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

3.4 Adjusting and cleaning

A. Immediately clean exposed surfaces of the louvers to remove fingerprints and dirt accumulation during the installation process. Do not let soiling remain until the final cleaning.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to the material finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers and accessory components damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by the Architect, remove damaged materials and replace with new materials.
   1. Touch up minor abrasions in finishes with a compatible air-dried coating that matches the color and gloss of the factory applied coating.

END OF SECTION

PART 1 - GENERAL

1.0 RELATED WORK SPECIFIED ELSEWHERE:

A. Tile Backer Board: Section 09 28 13.

1.0 DEFINITIONS:

A. Sheet Steel Gages: US Standard.

B. Gypsum Board Terminology: ASTM C 11 - Standard Terminology Relating to Gypsum and Related Building Materials and Systems.

1.0 SUBMITTALS:

A. Product Data: Catalog sheets, specifications, and installation instructions for each item specified.

1.0 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.0 PROJECT CONDITIONS:

A. Environmental Requirements: Comply with gypsum board manufacturer's printed temperature and ventilation requirements during application and finishing. Ventilate installation areas to relieve excess moisture.

PART 2 - PRODUCTS

2.1 FRAMING:

A. Studs, Tracks, and Furring: ASTM C 645; 25 gage (minimum base metal thickness 0.0179 inch) galvanized steel, with additional framing members, reinforcing, accessories, and anchors necessary for the complete framing system.
   1. Deep-Leg Deflection Track: ASTM C 645 top runner with 2 inch deep flanges.
   2. Hat-Shaped, Rigid Furring Channels: ASTM C 645; 25 gage (minimum base metal thickness 0.0179 inch) galvanized steel.

2.2 GYPSUM BOARD:

A. Moisture-resistant Polycarbonate Laminated Gypsum Board: 5/8 inch Gypsum Board laminated to .080 inch thick polycarbonate. Laminated product shall meet "Class A" interior wall and finish classification. Long edges of gypsum board tapered with beveled or rounded edges.
   1. Acceptable Products:
      a. CoreGuard by Pinnacle Armor, 5425 E. Home Ave. #104, Fresno, CA 93727, (800) 200-0915, www.pinnaclearmor.com.
      b. NuGuard Security Wall Panels, Nudo Products, Inc., 1500 Taylor Ave., Springfield, IL 62703, (800) 826-4132, www.nudo.com.

2.3 FASTENERS:

A. Steel Drill Screws: ASTM C 1002; gypsum board manufacturer's recommended types and sizes for substrates involved.

B. Laminating Adhesive: Gypsum board manufacturer's recommended type for substrates involved.

C. Expansion Anchors: Anchor bodies AISI 1018 or 12L14, of dimensions indicated; with nuts, ASTM A 563; and flat washers. Expansion sleeves AISI 1010, of dimensions indicated; with bolts, SAE Grade 5; and flat washers.

D. Toggle Bolts: Tumble wing type.
1. Wing Body: AISI 1008-1010 or equivalent cold rolled steel.
2. Trunnion Nut: 1/4 inch thru 3/8 inch AISI 1010 steel; 1/2 inch Zamac alloy.
3. Screw: Carbon steel.

E. Self Threading Masonry Screws: Zinc plated; Tapcon Fasteners by ITW Buildex 1349 West Bryn Mawr Ave. Itasca, IL 60143, (800) 284-5339.

2.4 TRIM:

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized steel or extruded vinyl.
2. Shapes:
   a. Cornerbead: Use at outside corners.
   b. Bullnose Bead: Use where indicated.
   c. LC-Bead: J-Shaped, exposed long flange receives joint compound. Use at exposed panel edges.
   d. L-Bead: L-shaped, exposed long leg receives joint compound with tear away bead. Use where gypsum board abuts or intersects dissimilar material.
   e. U-Bead: J-shaped, exposed short flange does not receive joint compound. Use where indicated.
   f. Expansion (Control) Joint: Use where indicated.

2.5 JOINT TREATMENT MATERIALS:

A. Joint Tapes: ASTM C 475; plain or perforated.

B. Joint Compound: ASTM C 475; gypsum board manufacturer's recommended dry powder or ready-mixed, either of the following:
1. One Compound Treatment: One compound for both bedding and finishing joints.
2. Two Compound Treatment: Compatible joint compounds; one compound for bedding and the other compound for finishing joints.

C. Special Edged Gypsum Board: Gypsum board manufacturer's special joint treatment materials.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine substrates to which gypsum board system attaches or abuts, preset steel door frames, cast in anchors, and structural framing, with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of gypsum board system construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CONSTRUCTION TOLERANCES:

A. Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.

3.3 STEEL FRAMING INSTALLATION:

A. Installation Standards: ASTM C 754, and ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking, and bracing at terminations in gypsum board system to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations.

C. Isolate partitions from structural elements as indicated to prevent transfer of structural loads or movements to partitions.

D. Partition Framing Installation:
1. Align tracks accurately at floor and ceiling. Secure tracks as recommended by the framing manufacturer for the floor and ceiling construction involved, except do not exceed 24 inches oc spacing for powder-driven fasteners, or 16 inches oc for other types of attachment. Provide fasteners approximately 2 inches from corners and ends of tracks.
2. Position studs vertically and engage both floor and ceiling tracks. Install studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edge of stud flanges first. Space studs 16 inches on center, unless otherwise indicated on the Drawings. Fasten studs to track flanges with screws or by crimping.
3. Use full length studs between tracks wherever possible. If necessary, splice studs with a minimum 8 inch nested lap and fasten with two screws per stud flange.
4. Install additional studs to support inside corners at partition intersections and corners, and to support outside corners, terminations of partitions, and both sides of control joints (if any).
5. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
6. Brace chase wall framing horizontally to opposite studs with 12 inch wide gypsum board gussets or metal framing braces, spaced vertically not more than 4 feet on center.
   a. Attach gypsum board gussets with a minimum 3 screws per stud flange.
   b. Attach metal framing braces with a minimum 2 screws per stud flange.
7. Install rough framing at openings consisting of full-length studs adjacent to jambs and horizontal header and sill tracks. Cut horizontal tracks to length and split flanges and bend webs at ends for flange overlap and screw to jamb studs. Install intermediate studs between jamb studs at head and sill sections, at same spacing as full-length studs.
8. At door frames, install rough framing as specified above. Install jamb studs to comply with framing manufacturer's recommendations for the types of frames and weights of doors required. Fasten jamb studs to metal frames with anchor clips using 2 self tapping screws or bolts per clip.
9. Where solid core wood doors, double doors, or doors weighing more than 50 lb are indicated or scheduled, install two studs at each jamb and one additional stud not more than 6 inches from jamb studs.
10. Where vertical control joints are shown at jamb lines, install additional vertical studs located on opening side of jambs and not less than 1/2 inch from jamb studs. Do not fasten the additional studs to tracks or jamb studs.
11. Where wall mounted door bumpers are scheduled, provide horizontal reinforcement consisting of 2 pieces of framing installed back-to- back, flush with the face of adjacent stud flanges.

E. Surface Mounted Rigid Steel Furring Installation:
1. Install rigid steel furring where gypsum board is to be installed over masonry or concrete wall substrates, unless otherwise shown.
2. Install steel furring at 24 inches oc maximum spacing and provide additional furring at openings, cutouts, and corners. Securely anchor with fasteners spaced 24 inches oc maximum and stagger on opposite flanges of hat-shaped channels.

3.4 GYPSUM BOARD INSTALLATION:

A. Install gypsum board in the most economical direction, of maximum lengths to minimize end butt joints. Where unavoidable, locate end butt joints as far from center of walls or ceilings as possible.

B. Install gypsum board with face side out. Butt boards together at edges and ends over firm bearing with not more than 1/16 inch of open space between boards. Do not force into place.

C. Fasteners: Fasten gypsum board to supports and furring with steel drill screws of required size and spacing as recommended by the gypsum board manufacturer.
   1. Multiple-layer Work:
      a. Mechanically fasten both layers.
      b. Stagger vertical joints in multiple layer Work. Offset joints not less than 10 inches.

D. Provide additional framing and blocking required to support gypsum board at openings and cutouts.

E. Form control joints in gypsum board where indicated. Allow 1/2 inch continuous opening between boards to allow for insertion of control joint trim.

F. Wood Supports: Provide "floating" interior angle construction between gypsum board at interior corners.

G. Reinforce joints formed by tapered edges, butt edges, and interior corners or angles with joint tape.

3.5 TRIM INSTALLATION:

A. Coordinate installation of trim progressively with gypsum board installation where trim is of type required to be installed prior to, or progressively with installation of gypsum board.

B. Securely fasten trim pieces in accordance with manufacturer's printed instructions.

C. Install cornerbeads at external corners. Install LC-Bead (J-Bead) beads at unprotected (exposed) edges and where gypsum board abuts dissimilar materials. Use single unjointed lengths unless otherwise approved by the DAS Project Manager.
   1. Miter corners of semi-finishing type casing and trim beads.

D. Install control joint trim in accordance with ASTM C 840, where indicated.

E. Comply with joint compound manufacturer's recommended drying time for the relative humidity and temperature at time of application. Allow minimum of 24 hours drying time between applications of joint compound.

3.6 LEVELS OF GYPSUM BOARD FINISH:

A. General: Finish panels to levels indicated below, in accordance with ASTM C 840, for locations indicated.
   1. Level 3 Finish: Joints and angles, provide tape embedded in joint compound and provide two separate applications of joint compound over all joints, angles, and fastener heads. Accessories shall be covered with two separate coats of joint compound. Joint compound to be smooth and free of tool marks and ridges. Cover the prepared surface with a drywall primer prior to the application of the final decoration.

END OF SECTION 09 21 16

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. Joint Sealers: Section 07 92 00.

1.2 SYSTEM DESCRIPTION:

C. Flooring, Base and Walls: Epoxy composition flooring, base and walls not less than 1/4 inch thick composed of an epoxy resin matrix and mineral filler aggregate, lightly ground, with a cleanable skid-resistant safety topping and sealed finish.

1.3 SUBMITTALS:

A. Product Data: Submit printed product descriptions, physical properties data, color charts, specifications, and application instructions as applicable, for each material specified except reinforcement and sealants.

B. Samples:
1. Flooring and Base Combination: Each type and color; 12 inches x 12 inches x height of base plus one inch, complete with dividing strip at the toe and bead at top of base. Mount sample on plywood.
2. Underlayment Components: One quart.
3. Liquid Binder for Reinforcement: One quart.
4. Clear Sealer: One quart.

C. Quality Control Submittals:
1. Test Reports: At the request of the Director, furnish test reports from an independent testing laboratory showing that the submitted flooring materials meet or exceed specified physical properties and performance requirements.
2. Certificates: Affidavit required under Article 3.01.
3. Installer's Qualifications Data: Affidavit required under Quality Assurance Article.
4. List of Completed Installations: At the request of the Director, furnish a list of at least 5 comparable installations of the submitted flooring materials with a satisfactory service life of not less than 3 years.

D. Contract Closeout Submittals:
1. Maintenance Data: Deliver 2 copies of the flooring manufacturer's printed recommendations for cleaning and maintaining the installed flooring to the DAS Project Manager.

1.4 QUALITY ASSURANCE:

A. Installer's Qualifications: The person supervising the Work of this Section and the workers installing the flooring system shall be personally experienced in epoxy resin flooring work and shall have been regularly employed by a company engaged in this type of flooring installation for a minimum of 3 years.
1. Furnish to the Director the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.

B. Materials furnished for each type and color of flooring and base shall be from the same batch number.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to the Site in factory sealed containers, clearly labeled and marked with manufacturer's name, address, batch number, and date of manufacture.

B. Store materials in accordance with manufacturer's printed instructions.

1.6 PROJECT CONDITIONS:

A. Environmental Requirements:

1. Make arrangements thru the DAS Project Manager for maintaining temperature and relative humidity conditions necessary for proper installation and curing of the Work. Comply with flooring manufacturer's recommendations.
2. Maintain temperature and relative humidity conditions necessary for proper installation and curing of the Work. Comply with flooring manufacturer's recommendations.
3. Maintain sufficient ventilation in areas to receive the Work of this Section. Follow flooring manufacturer's recommendations.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Fill:
1. For Thickness up to 2-1/2 inches: Flooring manufacturer's standard or recommended liquid binder, fillers, and aggregate.
2. For Thickness of More than 2-1/2 inches: Concrete fill, specified elsewhere.

B. Underlayment: Liquid binder and filler recommended by the flooring manufacturer.

C. Waterproofing: One of the following, in compliance with the flooring manufacturer's printed recommendations:
1. Latex or resin membrane, reinforced with continuous filament swirl glass fabric. Weight of glass fabric not less than 4 oz per sq yd.
2. Elastomeric rubber membrane, neoprene or urethane, one or 2 component liquid formulation.

D. Reinforcement: Continuous filament swirl or woven glass fabric, not less than 4 oz per sq yd, embedded in latex or resin binder.

E. Primer: Flooring manufacturer's standard or recommended type.

F. Flooring, Base and Walls:
1. Epoxy Resin Matrix: Two component epoxy resin base and epoxy curing agent; 100 percent solids, internally colored. Cured binder (matrix) shall be chemically resistant to the following reagents when tested in accordance with ASTM D-543, after immersion time of 7 days:
   a. Soap Solution (1 percent).
   b. Detergent (.025 percent).
   c. Hydrochloric Acid (37 percent).
   d. Acetic Acid (5 percent).
   e. Lactic Acid (5 percent).
   f. Citric Acid (20 percent).
   g. Gasoline (regular).
   h. Ethyl Alcohol.
   i. Uric Acid.
2. Aggregate Fillers: Clean, dry, and dust free inert aggregate. Type, size, color, and proportion recommended by the flooring manufacturer to produce flooring to match the approved sample.
3. Physical properties of cured flooring and base:
   a. Tensile Strength: 2000 psi min in accordance with ASTM C-307.
   b. Bond Strength: 10,000 psi min, after 7 days, in accordance with ASTM C-579.
   c. Bond Strength: 325 psi min, with concrete failure after 7 day water immersion, in accordance with ACI 403.
   d. Surface Hardness: Shore D Durometer 60 min in accordance with ASTM D-2240.
4. Safety Topping: Two component epoxy resin base and epoxy curing agent with colored siliceous aggregate.
5. Colors:
   a. Colors as indicated on the Drawings, or if not indicated, as selected by the Director from the manufacturer's standard range of colors. Colors chosen for the base may be different from the colors chosen for the flooring in the same area and may differ from space to space.

G. Sealer: Flooring manufacturer's standard or recommended clear sealer.

H. Metal Accessories:
1. Dividing Strips: Zinc, with 1/8 inch thick vertical leg.

2. Base Bead: 16 gage zinc, with one inch leg for attachment to wall.
3. Flashing: 24 oz copper.
4. Extension Collars for Existing Floor Drains: Non-ferrous metal recommended by flooring manufacturer.

I. Sealant: One-part, mildew resistant silicone sealant (Type 1D) specified in Section 079200.

PART 3 EXECUTION

3.1 EXAMINATION:

A. Verification of Conditions: Examine surfaces scheduled to receive the Work of this Section for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Certification: Furnish affidavit by the flooring installer that the surfaces to receive the Work of this Section have been examined and are acceptable for application of the approved flooring. Do not install the flooring until such certification has been acknowledged by the Director in writing.

3.2 PREPARATION:

A. Prior to application of surface preparation materials, underlayments and flooring, remove dirt, paint, wax, and other foreign material that may prevent bonding of new materials. Vacuum the entire substrate to remove debris and dust.

B. Unless otherwise recommended by the flooring manufacturer in writing, prepare the substrate as follows:
1. New Concrete: Mechanically scarify the cured concrete surface, or wash it with a 10 percent muriatic acid solution and rinse thoroughly with clean water and let dry. Locate and mark expansion joints for later installation of dividing strips. Fill and level depressions, voids, cracks, and construction joints with underlayment.

3.3 INSTALLATION:

A. Fill: Place fill (or additional underlayment) where shown on the Drawings. For thickness up to 2-1/2 inches, use materials recommended by the flooring manufacturer. For thickness over 2-1/2 inches, use concrete fill specified elsewhere.

B. Waterproofing: Where waterproofing is shown on the Drawings, install membrane in accordance with the manufacturer's printed instructions. Unless otherwise detailed on the Drawings, carry the membrane up vertically to the top of the base, and down into the drain bodies.

C. Reinforcement: Where waterproofing is not required, install reinforcement at intersections of horizontal and vertical surfaces of epoxy flooring. Unless otherwise dimensioned in the manufacturer's printed instructions, turn the reinforcing out onto the horizontal a minimum of 5 inches and up on the vertical to within one inch of the top of base. At floor drains, center a 30 inch square reinforcing membrane over the drain and turn down into drain body.
1. Existing Tile Floors: Install reinforcement over the entire floor area, and up on the vertical to within one inch of the top of base.

D. Metal Accessories: Install dividing strips, control joints, expansion joints, and base beads level and true to line. Set accessories in underlayment material to fill voids and substrate irregularities. Position the dividing strips, control joints, expansion joints, and base beads as required to serve as screeds for the required finish thickness of the flooring and base.
1. Control Joints: Where control joints appear in the floor slab, install a dividing strip in the epoxy flooring. Locate the strip vertically above the joint for the full length.
   a. Saw-cut control joints (in lieu of installing dividing strips) where indicated. Cut joints after the flooring has cured, and fill joint with sealant, in accordance with the flooring manufacturer's recommendations.
2. Expansion Joints: Locate at existing building expansion joints and where shown on the Drawings. Carry expansion joints thru the entire flooring system. Where waterproofing membrane is called for, provide membrane joint treatment at expansion joints as recommended by the epoxy flooring manufacturer. Where expansion joint slip cover plates are

not required, place a dividing strip on each side of joint and apply sealant as detailed on the Drawings or as recommended by the epoxy flooring manufacturer.

3. Install additional dividing strips at dividing lines between changes of color and types of flooring and base.
4. Install metal base bead along the top edge of projecting bases.
5. Flashings: Install flashings at pipes, conduits, and other items that penetrate thru the floor. Match the height of the wall base, unless otherwise shown on the Drawings.
6. Adjustment of Existing Floor Drains: Perform necessary Work to bring floor drain gratings to the same plane as the adjacent finished epoxy flooring. Adjust clamping rings and flange collars. Provide new matching parts if the existing are damaged in the course of the Work. Where flange collars (receivers for gratings) cannot be adjusted, install extension collars to obtain a neat and secure fitting of the gratings.

E. Flooring and Base:
1. Install flooring and base with a finished thickness of not less than 1/4 inch (exclusive of underlayments, surface preparation materials, waterproofing, and reinforcement). Comply with the manufacturer's printed application instructions, unless otherwise specified.
2. Depositing: Distribute the mix evenly and screed to the required thickness. Compact the mix to eliminate voids and air pockets.
   a. Deposit Limits: Schedule the Work so that, at the end of the work day, the applied flooring terminates at dividing strips, walls, or other definite borders. Terminate the Work by use of bond-breaking temporary screeds only where other methods cannot be executed and where continuation of Work will not leave any visible line in the finished flooring.
   b. Base: Install base of height and type indicated.
4. Grinding: Lightly machine-grind the flooring with a No. 100 stone to obtain a uniform surface, free of trowel marks, waves or other imperfections. Clean and vacuum the floor. Check for voids, pits or other defects. Where required, fill defects with epoxy grout and regrind as necessary. Clean the floor in accordance with the manufacturer's recommendations. Let the floor dry completely before applying sealer.
5. Grinding Base: Where necessary, hand-grind the base to eliminate trowel marks or other rough spots. Provide a surface that is uniformly textured and free of voids, pits, or other defects. Clean the base thoroughly before applying sealer.
7. Applying Safety Topping:
   a. Vacuum Work surfaces to remove dust.
   b. Apply topping binder and aggregate in accordance with manufacturer's printed instructions.
   c. After binder dries, remove loose aggregate and vacuum the surface to remove dust.
   d. Apply sealer in accordance with manufacturer's printed instructions.

F. Walls:
1. Install two applications of Epoxy Block Filler to provide a smooth, even surface for coating.
2. Apply epoxy top coats to primed or filled surface with high quality ½" nap roller (to avoid nap hairs in finish) at approximately 160 ft² per gallon per coat.
3. Allow to cure 8-12 hours at 75 degrees F. before recoating.
4. All surface irregularities in the cured top coat should be sanded prior to application of additional top coat(s). Final finish will have a slight orange peel texture. Important: certain light colors (e.g., White Sand, Sand, Taupe) may require additional applied thickness (30 mils minimum) to achieve proper pigment hinding.
5. Allow final top coat to cure a minimum of three (3) days at 75 degrees F. before opening for use or cleaning.

END OF SECTION 09 67 23

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. All of the Contract Documents including General Conditions, Modifications and Division 1 General Requirements, apply to the work of this section.

B. Carefully examine all of the Contract Documents for requirements which affect the work of this section. The exact scope of work of this section cannot be determined without a thorough review of all specification sections and other contract documents.

1.2 DESCRIPTION OF WORK:

A. Extent of painting work is shown on drawings and as herein specified.

B. The work includes painting and finishing of interior exposed items and surfaces throughout project limits, except as otherwise indicated.

C. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other Sections of Work.

D. "Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

E. Paint exposed surfaces whether or not colors are designated in "schedules", except where natural finish of material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas. If color or finish is not designated, Architect will select these from standard colors available for materials systems specified.

1.3 PAINTING NOT INCLUDED:

A. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated components such as architectural woodwork, wood casework, and shop-fabricated or factory-built mechanical and electrical equipment or accessories.

B. Mechanical and Electrical Work: Painting of mechanical and electrical work is specified in Division 23 and 26, respectively, except as noted in this Section.

C. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) pre-finished partition systems, acoustic materials, architectural woodwork and casework, finished mechanical and electrical equipment including light fixtures, switchgear and distribution cabinets.

D. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas.

E. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.

F. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated.

G. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

1.4 QUALITY ASSURANCE:

A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

B. Coordination of work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

C. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

1.5 SUBMITTALS:

A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.

B. Samples: Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.

1.6 DELIVERY AND STORAGE:

A. Deliver all materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Name or Title of Material
2. Federal Specification Number, if Applicable
3. Manufacturer's Stock Number and Date of Manufacturer
4. Manufacturer's Name
5. Contents by Volume, for Major Pigment and Vehicle Constituents
6. Thinning Instructions
7. Application Instructions
8. Color Name and Number.

1.7 JOB CONDITIONS:

A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C), unless otherwise permitted by paint manufacturer's printed instructions.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F (7 degrees C) and 95 degrees F (35 degrees C, unless otherwise permitted by paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.

D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Manufacturer: Drawings and Specifications are based upon paint products as manufactured by Benjamin Moore. Products by other manufacturers will not be accepted.

2.2 MATERIALS:

A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Lead content in pigment, if any, is limited to contain not more than 0.5% lead, as lead metal based on the total non-volatile (dry-film) of paint by weight.

C. This limitation is extended to interior surfaces and those exterior surfaces, such as stairs, decks, porches, railing, windows, and doors which are readily accessible to children under seven years of age.

2.3 INTERIOR PAINT SYSTEMS:

A. Provide following paint systems for various substrates, as indicated.

B. Ferrous Metal L (Semi-Gloss), Doors, Trim and Railings
1st Coat: (Refer to drawings for color designation)
2nd Coat:(Refer to drawings for color designation)
3rd Coat: (Refer to drawings for color designation)

C. Gypsum Drywall (Eggshell) Walls, Ceilings, Soffits
1st Coat: (Refer to drawings for color designation)
2nd Coat:(Refer to drawings for color designation)
3rd Coat: (Refer to drawings for color designation)

D. Painted Semi-Gloss Trim
1st Coat: (Refer to drawings for color designation)
2nd Coat:(Refer to drawings for color designation)
3rd Coat: (Refer to drawings for color designation)

PART 3 - EXECUTION

3.1 INSPECTION:

A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION:

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

B. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and

adjacent surfaces. Following completion of painting of each space or area, reinstall removed items by workman skilled in the trade involved.

C. Clean surfaces to be painted before applying paint or surface treatments. Sand existing walls scheduled for re-finishing if the existing finish has a low luster/eggshell type finish to remove any sheen prior to applying new finish. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaced.

D. Ferrous Metals:
1. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
2. Radiators: Plumbing contractor to remove radiators from wall to enable painting preparation of radiator and the wall behind it.

E. Touch up shop applied prime coats wherever damaged or bare, where required by other sections of these Specifications. Clean and touch-up with the same type shop primer.

3.3 MATERIALS PREPARATION:

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION:

A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

C. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

3.5 SCHEDULE PAINTING:

A. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

B. Allow sufficient time between successive coating to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting of loss of adhesion of the undercoat.

3.6 MINIMUM COATING THICKNESS:

A. Apply each material at not less than the manufacturer's recommended spreading area, to establish a total dry film thickness as indicated or, if not indicated, as recommended by the coating manufacturer.

3.7 PRIME COATS:

A. Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others.

B. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.

3.8 PIGMENTED (OPAQUE) FINISHES:

A. Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

3.9 CLEAN UP AND PROTECTION:

A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

D. Provide "Wet Paint" Signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

E. At the completion of work of other trades, touch-up and restore all damaged or defaced surfaces.

END OF SECTION

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PART ONE - GENERAL

1.1 SUMMARY:

A. Section Includes:
   1. Solid plastic, floor-mounted toilet partitions and urinal screens.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES:

A. ASTM International (ASTM):
   1. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   2. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.3 SYSTEM DESCRIPTION:

A. Compartment Configurations:
   1. Toilet partitions and privacy screens: Ceiling Hung.
   2. Urinal screens: Wall mounted.

1.4 SUBMITTALS:

A. Submittals for Review:
   1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories.
   2. Product Data: Manufacturer's descriptive data for panels, hardware, and accessories.
   3. Samples: 3 x 3 inch samples in Black 2000 C color.

1.5 PERFORMANCE REQUIREMENTS:

A. Fire Resistance:
   1. Partition materials shall comply with the following requirements, when tested in accordance with the ASTM E84: Standard Test Method for Surfaces.
   2. Burning Characteristics of Building Materials;
      a. Smoke Developed Index: Not to exceed 450
      b. Flame Spread index: Not to exceed 75
      c. Material Fire Ratings:
         - National Fire Protection Association (NFPA): Class B
         - International Code Council (ICC): Class B

1.6 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Minimum 5 years experience in manufacture of solid plastic toilet compartments with products in satisfactory use under similar service conditions.

B. Installer Qualifications: Minimum 5 years experience in work of this Section.

1.7 WARRANTIES:

A. Provide manufacturer’s 25 year warranty against breakage, corrosion, and delamination under normal conditions.

PART TWO - PRODUCTS

2.1 MANUFACTURERS:

A. Contract Documents are based on ASI Global Partitions – (Phenolic Ultimate privacy partitions).

2.2 MATERIALS:

A. Doors, Panels and Pilasters:
1. High density polyethylene (HDPE), fabricated from polymer resins compounded under high pressure, forming single thickness panel.
2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
3. 1 inch thick with edges rounded to 1/4 inch radius.
4. Color: as selected from Manufacturer's standard colors.

B. Aluminum Extrusions: ASTM B221, 6463-T5 alloy and temper.

C. Stainless Steel: ASTM A167, Type 304.

2.3 HARDWARE:

A. Hinges:
1. 8 inches long, fabricated from heavy-duty extruded aluminum with bright dip anodized finish, wrap-around flanges, adjustable on 30-degree increments, through bolted to doors and pilasters with stainless steel, Torx head sex bolts.
2. Hinges operate on field-adjustable nylon cams, field adjustable in 30 degree increments.

B. Door Strike and Keeper:
1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, with wrap-around flanges secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
2. Bumper: Extruded black vinyl.

C. Latch and Housing:
1. Heavy-duty extruded aluminum.
2. Latch housing: Bright dip anodized finish.
3. Slide bolt and button: Black anodized finish.

D. Coat Hook/Bumper:
1. Combination type, chrome plated Zamak.
2. Equip outswing handicapped doors with second door pull and door stop.

E. Door Pulls: Chrome plated Zamak.

2.4 COMPONENTS:

A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.

B. Pilasters: Mounted 14 inches above floor, secured to ceiling supports with manufacturer's standard hardware. fastened to pilaster sleeves with stainless steel tamper resistant Torx head sex bolt, with stainless steel angle attachment to floor and ceiling.

C. Pilaster Sleeves: 4 inches high, 20 gage stainless steel, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.

D. Wall Brackets: 54 and 68 inches long, heavy-duty aluminum, bright dip anodized finish, fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.

PART THREE - EXECUTION

3.2 INSTALLATION:

A. Install compartments in accordance with manufacturer's instructions and approved Shop Drawings.

B. Install rigid, straight, plumb, and level.

C. Locate bottom edge of doors and panels 14 inches above finished floor.

D. Provide uniform, maximum 3/8 inch vertical clearance at doors.

E. Not Acceptable: Evidence of cutting, drilling, or patching.

3.2 ADJUSTING:

A. Adjust doors and latches to operate correctly.

END OF SECTION

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract apply to work of this Section.

1.2 DESCRIPTION OF WORK:

A. The extent of each type of toilet accessory is shown on the drawings and specified herein.

B. Toilet Partitions: Specified in Section 10 21 13.

1.3 QUALITY ASSURANCE:

A. Products: Provide products of manufacturer specified or an approved equal. Stamped name or labels on exposed faces of units will not be permitted. Provide locks where indicated, with the same keying for all accessories. Furnish two keys for each lock.

1.4 SUBMITTALS:

A. Manufacturer's Data: For information only, submit 2 copies of manufacturer's technical data and installation instructions for each toilet accessory. Transmit copies of installation instructions to the Installer.

PART 2 – PRODUCTS

2.1 MANUFACTURER:

A. Bobrick Washroom Equipment, Inc., New York, or Architect approved equal.

Description	*Dwg Abbrev.*	*Mfr. No.*	*Type of Mounting*
Grab Bar	GB	B-5806.99 x 18” B-5806.99 x 36” B-5806.99 x 42”	Surface
Sanitary Napkin Disposal	ND-P	B-35139	Partition
Coat Hook	CH2	B-6827	Surface
Mop and Broom Holder	MBH	B-223	Surface
Mirror	M	B-1658 1830	Surface
Baby Changing Station	BCS	KB200	Surface

B. Dyson Corp. or Architect approved equal.

Description	*Dwg Abbrev.*	*Mfr. No.*	*Type of Mounting*
Hand Dryer (White)	HD	2902-287800	Surface

2.2 ACCESSORY SCHEDULE BY ROOM:

A. See Architectural Drawings.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Installer must examine substrates, previously installed inserts and anchorages necessary for mounting of toilet accessories, and other conditions under which installation is to occur, and must notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION:

A. Install toilet accessory units in accordance with manufacturer's instructions, using concealed fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations indicated.

3.3 KEYING:

A. Provide same keying for all toilet accessories. Provide Owner's representative with 6 keys.

3.4 ADJUST AND CLEAN:

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly.

B. Clean and polish all exposed surfaces after removing protective coatings.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. General: Perform earthwork in accordance with the Contract Documents.

B. Work Included: Work of this Section includes all labor, materials, equipment, and services necessary to complete the excavation, foundations, subgrade preparation, filling and grading as shown on the Drawings and specified herein including, but not limited to the following:

1. All earth and rock excavation to the bottom of foundations, walls, pits, slabs, manholes, etc. as required and indicated on the Contract Drawings or to a lower elevation to achieve required bearing capacity, as directed by the Geotechnical Engineer.
2. Excavation, filling and rough grading of site area at adjacent structures and roadways as required and within the Contract Limit Line.
3. Excavation, filling, grading and compacting to required elevations for all fields, floors, slabs on grade, structural slabs, walls, slopes, and cuts.
4. Excavation, filling, grading and compacting to required elevations for appurtenances and site work.
5. Filling and compacting of soil below foundation slab-on-grades, behind below grade walls, and beneath structural slabs.
6. Legal disposing off the site, of surplus excavated materials unsuitable for filling or backfilling.
7. Pumping and dewatering as required for work of this section and for buildings and river crossing foundation work.
8. Subgrade preparation for foundations.
9. Protection and monitoring of adjacent structures, utilities and pavements.
10. Other labor and materials as may be reasonably inferred to be required to make the work under this Section complete.
11. Earthwork associated with demolition of existing structures.

1.02 RELATED DOCUMENTS

A. Section 31 23 19 – Dewatering

B. Section 31 23 33 – Trench Excavation and Backfill for Utilities

C. Section 31 25 00 – Soil Erosion and Sediment Control

1.03 REFERENCES

A. General: All work and materials under this section shall conform to the latest revision of the following standard specifications, where not otherwise required by the Contract Documents:

B. American Society for Testing and Materials (ASTM) – latest edition.

1. C 136 Test for Sieve Analysis of Fine and Coarse Aggregates
2. D 422 Method for Particle Size Analysis of Soils
3. D 698 Test for Moisture - Density Relations of Soils - Standard Proctor Method
4. D 1140 Test for Amount of Material in Soils Finer than No. 200 (75 mm) Sieve
5. D 1556 Test for Density and Unit Weight of Soil in Place by the Sand-Cone Method
6. D 1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)
7. D 2216 Laboratory Determination of Moisture content of Soil
8. D 2487 Classification of Soils for Engineering Purposes
9. D 2922 Tests for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)
10. D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

11. D 4253 Test Method of Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
12. D 4254 Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density
13. D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils

C. American Association of State Highway and Transportation Officials (AASHTO) – Latest edition.
1. T 88 Mechanical Analysis of Soils

D. All work shall comply with the requirements of the Connecticut State Building Code (latest edition), and the requirements and regulations of any other Federal, State, or Local ordinances having jurisdiction.

1.04 SUBMITTALS

A. Within ten days after award of the contract, the Contractor shall submit to the Architect a schedule detailing the sequence, and time of completion of all phases of work under this section.

B. At least two weeks in advance of imported fill use, the Contractor shall submit either the following laboratory test data to the Geotechnical Engineer for each type of imported soil/gravel material to be used as compacted fill:
1. Test reports on borrow material as follows:
   a. Moisture and Density Relationship: ASTM D1557.
   b. Mechanical Analysis: AASHTO T-88.
   c. Moisture content in accordance with ASTM D 2216.
   d. Relative Density: ASTM D2049.
   e. California Bearing Ratio (CBR): ASTM D1883.
   f. Plasticity Index: ASTM 4318.
2. Include data for all samples indicating the exact location and methods of transportation and placement of all materials.
3. Documentation of proof that imported material is ‘certified clean fill’

C. Submit the name of each material supplier and specific type and source of each material. Any change in source or soil type throughout the job requires approval of the Builder and the Geotechnical Engineer.

D. Shop Drawings:
1. Submit detailed shop drawings and calculations, to be reviewed by the Owner’s Geotechnical Engineer, of earthwork procedures and sequences including temporary excavation support systems.
2. The drawings shall bear the signature and seal of a Professional Engineer registered in the State of Connecticut.

E. If rock or weathered rock is encountered, contractor shall submit full slope, weathered rock, and rock stabilization drawings, details, and calculations for review by the design team. The plans, details, and specifications shall be signed and sealed by a Professional Engineer licensed in the state of Connecticut.

F. Pre-Construction Conditions Survey: The Contractor will perform a pre-construction conditions survey of all immediate adjacent structures, the results of which will be made available to the Owner and Design Team upon completion of the survey.

G. Certification for Examination of Site and Records: Before proceeding with the Work, submit certification in an acceptable form, signed by the Contractor, stating that careful examination has been made of the site, existing structures, records of utility lines, test boring records, test pit records, and subsurface exploration reports by the Geotechnical Engineer, the Drawings, and all other Contract Documents.

H. Submit approvals and permits to the General Contractor a minimum of 15 days prior to commencement of construction.

1.05 ENVIRONMENTAL CONSIDERATIONS, SOIL EROSION AND SEDIMENT CONTROL

A. Install erosion control measures in the sequence shown of the plans or as directed by the civil engineer or regulatory agencies to protect adjacent properties and water resources from erosion and sediment damage.

B. Any off-site soil disposal requirement shall be performed in accordance with all applicable Local, State, and Federal regulations governing soil movement and disposal.

C. Dust and Erosion Control:
   1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operation and movement of construction vehicles, both on site and on paved ways. Comply with 2002 Connecticut Sediment and Erosion Control Guidelines.

1.06 PROJECT CONDITIONS

A. Groundwater was encountered during the 2014 subsurface exploration at about elevation 2'. See the Geotechnical Engineering Report referenced herein for complete subsurface information.

B. The fill is generally consisted of granular soils and contained trace amounts of brick, cinders, slag, and ash fragments. In some instances the presence of cobbles were inferred by "rig chatter". Boulder and relic structures may also be present in this stratum. See the Geotechnical Engineering Report referenced herein for complete subsurface information.

C. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the conformation of the ground, the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; the conditions of adjacent structures and utilities and all other matters which can in any way effect the work.

D. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of adjoining utilities and structures.

E. The Contractor shall make his own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those as calculated and/or anticipated by him. Additional borings and other exploratory operations may be performed by Contractor, at the Contractor's option and following the Owner's approval. No change in the Contract Sum will be authorized for such additional exploration undertaken by the Contractor.

F. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all Town and State, and Federal regulations concerning the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

1.07 PROTECTION

A. Protection of Adjacent Structures, Utilities and Pavements
   1. Prior to commencement of any work, consult the records for existing utilities, and note all conditions and limitations, which might affect the work required under this section.
   2. The Contractor shall become acquainted with the existence and location of all surface and subsurface structures and utilities within the project area. Contractor shall not damage any of those that are to remain and shall leave them accessible.

3. The work shall be executed so that no damage or injury will occur to existing public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric or any other pipes. Should any damage or injury caused by the contractor, or anyone in Contractor's employ, or by the work under this Contract occur, the Contractor shall, at his own expense, make good such damage and assume all responsibility for such injury.
4. Provide barricades and warning lights, barriers, etc, to prevent accidents, to avoid all necessary hazards and protect the public, the work, and property at all times, including Saturdays, Sundays, and holidays.
5. The above shall also include the protection of all existing utilities (including sewers, electrical lines and telecommunication lines) to remain in use within and adjacent to the area affected by the work of this project.
6. Monuments, bench marks and other reference features on streets bounding this project, shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced at own expense.
7. Excavation work shall be restricted to hours indicated in the Contract Documents.
8. The Contractor's surveyor shall install control points on the adjacent structures and pavement for vertical and horizontal monitoring (to the nearest 0.005 ft.). Control points shall be monitored weekly during excavation and foundation construction work.

B. Protection of Excavation Bottoms
1. Facilities and materials needed to prevent earth at bottom of excavation from becoming frozen or unsuitable to receive the foundations shall be furnished.
2. The excavation shall not be carried to final grades during freezing weather without providing complete protection against freezing of the subgrades as specified hereinafter. Complete protection against freezing shall also be provided if freezing weather sets in after completion of the excavation to final subgrade. This protection shall include adequate heating and coverage of the area to maintain temperatures above freezing until foundations have been concreted and backfilled.
3. Where excavations have been brought to the bottom elevations called for on the drawings, and the bottom of these excavations become unsuitable in the opinion of the Owner's Geotechnical Engineer because of inadequate protection by the Contractor, these excavations shall be carried to lower depths sufficient to provide stable bearing as determined by the Owner's Geotechnical Engineer.

1.08 ERRORS IN DEPTH

A. In the event that any part of the excavation is carried, through error, beyond the depth and the dimensions indicated on the drawings of called for in the specifications, then the Contractor, at his own expense, shall furnish and install gravel or stone with which to fill to the required level, in all locations except beneath footings and piers. At these locations, Contractor shall be required to fill to level of bottom footing with concrete mixed in the proportion of the foundations bearing on them. Where established bottoms as shown on drawings have not been maintained or have been disturbed by operations under this contract, they shall be cleaned out and filled with concrete mixed in the proportion of the footings bearing upon them, without additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Structural Fill: Well-graded sand and gravel having no more than 15% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible materials, cinders, frozen material, trash, masonry or rubble and free of particle having dimensions greater than 3-inches in all directions. The on-site fill and natural sand conforming to the above gradation criteria, with a maximum particle size should be 3 inches, and material that is not regulated as waste that requires off-site disposal can be reused as structural fill. The on-site fill material will need to be screened to remove all non-soil constituents or other deleterious material prior to re-use. Imported structural fill should be well graded sand and gravel having a maximum particle size of 3 inches and no more than 15% passing the No. 200 sieve. Any approved imported fill should be "certified clean fill" free of hazardous substances and meeting all site, local and

federal regulations. Recycled Concrete Aggregate could be used as engineered fill in areas not behind foundation walls or below slabs having underslab drainage systems. Structural fill shall be used as backfilling material within 4 feet of any structure, including footings, slabs, below-grade walls, utilities, manholes, catch basins, in areas greater than 2 feet above pavement subgrade, if acceptable with the project Civil Engineer.

B. General Fill: Well-graded sand and gravel having no more than 20% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible material, cinders, frozen material, trash, masonry or rubble and free of particles having dimensions greater than 3-inch in all directions. The on-site fill and natural sand conforming to the above gradation criteria and material that is not regulated as waste that requires off-site disposal can be reused as general fill. The use of recycled concrete aggregate as general fill shall be permitted provided it meets the gradation requirements above. General fill shall be used as backfilling material in non-finished areas (i.e. landscaped areas) or in areas greater than 2 feet below pavement subgrades, if acceptable with the project Civil Engineer.

C. Imported Fill: Well-graded sand and gravel having no more than 15% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible materials, cinders, frozen material, trash, masonry or rubble and free of particle having dimensions greater than 3-inches in all directions. Any approved imported fill should be “certified clean fill” free of hazardous substances and meeting all site, local and federal regulations.

D. Drainage or Granular Fill: Free draining natural crushed stone free of deleterious materials and conforming to the gradation requirements commercially known as clean, durable, ¾-inch crushed stone. Recycled concrete shall not be acceptable. Compacted Granular Fill placed for drainage behind foundation walls shall have no more than 5% dry weight passing the No. 200 sieve.

E. The use of recycled concrete aggregate (RCA) is not permitted as backfill material behind permanent below grade walls or in the vicinity of drainage structures.

F. Filter Fabric: Mirafi 140N manufactured by TC Mirafi or approved equivalent woven geotextile filter fabric where specified.

PART 3 - EXECUTION

3.01 CODES, PERMITS AND REGULATIONS

A. Comply with all applicable laws, rules, and ordinances and regulations of the Federal Government, Connecticut, and other jurisdictions.

B. Obtain and pay for all permits and licenses required to execute and complete the work.

C. In case of conflict between regulations and specifications, the Contractor shall comply with the most stringent applicable codes, regulations or specifications.

3.02 PUMPING AND DEWATERING

A. All pumping and dewatering work shall be conducted in accordance with the Dewatering Specification 31 23 19.

B. Provide adequate pumps, or other equipment, appurtenances, power, drains, materials and labor necessary to excavation continuously dry during excavation, foundation construction, and backfilling and at such other times as the progress of the work may demand or as necessary to insure safety to the structure shall be provided.

C. All pumping both inside and outside the areas of the building shall be performed, continued and maintained as required for the completion of all work, including the work of the mechanical trades, throughout the period of the contract.

D. Contractor shall manage runoff to limit impact on construction.

E. The dewatering system or systems shall be installed and operated in such a manner as to avoid the movement of fines or loss of ground from below the bearing level and shall not influence the stability of surrounding areas. The facilities needed to eliminate loss of ground shall be included.

F. The Contractor shall not use any portion of the building foundation units or any part thereof as a sump for drainage resulting from pumping in any other area. The Contractor shall not conduct water to privately owned properties.

G. Any pumped groundwater which will require off-site disposal shall comply with all Local, State, and Federal Environmental Regulations.

3.03 EXCAVATION

A. General
1. Excavation shall be unclassified and shall include removal and disposal of all materials encountered regardless of the nature of the materials and shall be understood to include but not limited to rock, boulders, earth, glacial till, silt, hardpan, fill, foundations, structures, slabs, walls, utilities, pavements, curbs, piping and debris, and others.
2. All excavation shall extend to the dimensions and elevations required for the installation of the work described herein and as indicated on the Drawings. Excavation shall be made to a depth that will allow installation of full depth of concrete slabs, and sub-base as shown on drawings and 1 inch tolerance. Excavation lines shall provide sufficient clearance for the proper execution of all concrete work, including allowances for form work, shoring and inspection.
3. Materials that in the opinion of the Owner's Geotechnical Engineer are not suitable for fill and any surplus earth shall be removed from the site and legally disposed of.
4. Existing utility lines to be retained that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Contractor, at own expense.

B. Excavation for Foundations
1. Foundation subgrades shall be observed and approved by the Owner’s Geotechnical Engineer before proceeding with the construction of foundations. Bottoms of footings shall be founded on natural sand, weathered rock, more competent rock, or structural fill having a net allowed uniform bearing pressures as specified in the Structural Drawings and as approved by the Owner’s Geotechnical Engineer.
2. Subgrade of foundations shall be level and free of loose soil, debris, standing water and frost prior to acceptance for placing concrete. A professional Geotechnical Engineer should observe and approve the foundation subgrade to verify that the subgrade material is adequate to provide the recommended allowable bearing pressure.
3. Unauthorized Excavation: When suitable bearing material is encountered at subgrade elevations shown on Drawings and excavation is made to greater depth, the foundations and foundation walls shall be extended to the lower elevation with concrete of the same strength used for the foundations, at no additional cost to the Owner.

C. Subgrade Preparation
1. Lawn subgrade preparation shall be accomplished as follows:
   a. Excavate all topsoil. Excavate natural and/or fill materials down to subgrade elevation and stockpile on-site. Proofroll as described below.
2. Natural undisturbed material shall be graded and compacted to attain a uniform surface. These areas shall be determined by the Geotechnical Engineer.
3. Prior to constructing foundations the subgrade shall be proofrolled in the presence of the Geotechnical Engineer for the following conditions:
   a. Proofrolling shall be accomplished with a minimum of six passes of a 1-ton walk-behind vibratory roller. Foundation elements shall not be placed until the subgrade is approved by the Geotechnical Engineer.
   b. Soft Areas during Compaction: If any areas show pumping, noticeable weaving, or which are otherwise unsatisfactory, undercut material within the limits and

extent ordered by the Geotechnical Engineer. These areas shall be replaced with either concrete of the same strength used for the foundation or structural fill, compacted to 95% of maximum dry density by ASTM D1557. The appropriate water content at the time of compaction should be plus or minus 2 percentage points of optimum moisture content as determined by the laboratory compaction test aforementioned, unless otherwise directed by the Engineer of Record.

D. Excavation for General Grading:
   1. Excavations made below the elevations shown or specified, unless authorized by Change Order, shall be filled and compacted as hereinafter specified, at no additional cost. A Change Order will be issued for authorized additional excavation.

E. Trench Excavation:
   1. Unless otherwise shown, specified or required, make trenches for piping and utilities not less than 12 inches or more than 24 inches wider than the outside width of the piping or utilities. Accurately grade bottoms of trenches with bell holes scooped out to provide uniform bearing and support of pipe and utilities on undisturbed soil throughout its entire length, except where other means of supporting pipe are indicated.
   2. Trenches for underground conduit and piping, where necessary, shall be excavated to the required depth and bell holes shall be provided where necessary to insure uniform bearing. Trench excavation lines shall provide sufficient clearance for the proper execution of underground mechanical work.
   3. Trenches shall be by open cut from the surface. No tunneling will be allowed except by consent of the Geotechnical Engineer. Irregularities at bottom of trench, or where excavation is below required depth, shall be refilled to required grade with compacted granular fill.
   4. Pipe trenches shall be excavated and minimum cover shall be provided to required depths as per the Connecticut State Building Code. Excavated materials adjacent to trench as directed shall be neatly banked.
   5. Where trenches are in wet or soft ground that in the opinion of the Geotechnical Engineer is unsuitable for supporting the piping, concrete cradles or approved equivalent shall be installed.
   6. Where necessary, the sides of trenches and excavations shall be supported by adequate sheeting and bracing and conform with applicable OSHA regulations to insure proper construction and safety of the workers. The Contractor will be held responsible for the sufficiency of sheeting and bracing and for all damages to property or injury to persons resulting from improper quality, strength, placing, maintaining and removing of same.
   7. Prior to utility installation, soil subgrades in the utility trenches should be proofrolled as specified herein. Pipe bedding should be placed and compacted in accordance with the pipe manufacturer's requirements or as indicated in the Drawings, whichever is more stringent.
   8. Immediately after piping has been installed, tested, inspected, and accepted, piping shall be filled around with special care to solidly fill voids without causing injury to piping. Up to two feet above the pipe's crown, the utility excavation shall be backfilled using structural fill placed in 4-inch thick loose lifts. For the remainder of trench backfill, the excavation shall be backfilled using structural fill placed in 12-inch thick loose lifts. Each layer shall be compacted before placing the next layer. Backfill shall be in such a manner so as to prevent future settlement.

3.04 FILLING AND COMPACTING

A. General
   1. Do not commence filling and backfilling operations until construction below finish grade has been approved, underground utilities and mechanical items inspected and tested, forms removed, waterproofing or damproofing and other improvements installed, trash and debris removed, and temporary and permanent bracing installed.
   2. Do not commence backfilling, filling and grading until existing subgrade has been compacted to 95% of the material's maximum dry density as determined by the Modified Proctor Compaction Test (ASTM D1557).
   3. Fill all excavations, backfill against all walls, and do all filling and grading necessary to bring the surfaces to the level required.

4. No fill material shall be placed on areas where free water is standing, or frozen subsoil area, or on surface which have not been approved for fill placement by the Geotechnical Engineer.
5. Do not backfill against concrete elements until the concrete has obtained its specified compressive strength.
6. Perform backfilling around foundation walls when the first floor provides sufficient bracing to withstand the backfill pressure. All other fill, backfill, and rolling to approximately finished grades shall then be completed.
7. Take particular care when rolling over areas where trenches or other excavations have been made and backfilled.
8. Grade bottoms of pavements and area way bottoms toward sediment pits or catch basins to maintain uniform thickness of the slabs.

B. Grading

1. Prior to placing fill or backfill in any area, grading shall be performed as required to provide for drainage. Ditching or filling around the area will be performed to intercept or divert all surface water. Within the area the ground which fill is to be placed on will be graded so as to provide for unobstructed drainage from every point to a sump or other disposal point.
2. On completion of grading as specified above, closely examine to determine whether excessive wetness, springs, or other seepage of water can be observed at any point. If such conditions exist, positive drainage in suitable form, such as french drains or tilling, must be provided before placement of fill is undertaken.

C. Placement and Compaction of Controlled Fill and Backfill

1. Placement
   a. Begin fill and backfilling in the lowest section of the area. Spread material evenly by mechanical equipment or by manual means above the approved compacted subgrade in lifts not exceeding 10 to 12 inches for material compacted by heavy machinery and 4 inches for material compacted by hand tamping. Build layers as horizontally as practical to prevent thickness of lift from exceeding that specified but provide with sufficient longitudinal and transverse slope to provide for runoff of surface water from every point.
   b. If backfilling on an existing slope is required, first clear and grub any vegetation, root systems and sod. The new slope should then be constructed in a “stepped” fashion beginning at the toe of the existing slope and moving up the face of the existing slope. This approach involves the removal of a portion of the existing slope such that the new fill is benched into the existing slope in lifts. The cut face of the benches created as part of the stepped construction should be sloped such that the individual steps are stable. The slope face of the new fill’s exterior edge should be over-built and then cut back to reveal the firm, compacted slope face and all loose, uncompacted material on the exterior slope face should be removed as part of the fine grading process.
   c. Moisture Control: The moisture-density curve for the fill use shall be supplied to the Contractor as a guide in controlling moisture to achieve the required degree of compaction. If, in the opinion of the Geotechnical Engineer, fill material becomes too wet for the required compaction, the fill shall be dried by a method approved by the Geotechnical Engineer prior to commencing or continuing compaction operations. Likewise, if, in the opinion of the Geotechnical Engineer, the fill material becomes too dry for the required compaction, the fill shall be moistened by a method approved by the Geotechnical Engineer prior to commencing or continuing compaction operations. The water content at the time of compaction should be within 2% points of the optimum water content.
2. Compaction: Compact each lift to 95% of the maximum dry laboratory density by ASTM D1557. The degree of compaction shall be checked by the Geotechnical Engineer and each successive lift shall not be placed or compacted until the previous lift is observed and approved by the Geotechnical Engineer. Compact the fill and backfill to elevations and limits shown on Drawings and is subject to final observation and approval by the Geotechnical Engineer.
3. Drainage During Fill Operation: At all times, maintain and operate proper and adequate surface and subsurface drainage to the satisfaction of the Geotechnical Engineer in order to keep the construction site dry and in such condition that placement and compaction of fill may proceed unhindered by saturation of the area.

4. Frost: Do not place fill materials when either the fill materials or the previous lift (or subgrade) on which it is placed is frozen. In the event that any fill which has already been placed on the surface shall become frozen, it shall be scarified and recompacted, or removed, to the approval of the Geotechnical Engineer before the next lift is placed. Remove or recompact any soft spots resulting from frost to the satisfaction of the Engineer before new fill is placed.

3.05 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.06 QUALITY CONTROL AND INSPECTION

A. The Owner will employ, at his own expense, a Geotechnical Engineer to review all laboratory test results and submitted reports specified in this Section.

B. Field Observation:
1. Foundation Subgrades: Foundation subgrades shall be observed by Owner's Geotechnical Engineer to verify the design bearing capacities. No foundation shall be constructed unless the Owner's Geotechnical Engineer approves the subgrade.
2. Paved Area and Building Slab Subgrades: Owner's Geotechnical Engineer shall observe Subgrades for paved areas and building slabs. No pavement or slab shall be constructed unless the subgrade approved by the Owner's Geotechnical Engineer.
3. Proofrolling: Proofrolling where required shall be inspected by Owner's Geotechnical Engineer.
4. Backfilling and Compaction: Backfilling and compaction below paved areas, building slabs, behind the foundation walls, and any other backfilling and compaction work shall be observed by the Owner's Geotechnical Engineer. No fill shall be placed unless the previous lift is approved by the Owner's Geotechnical Engineer. Owner's Geotechnical Engineer will take field density tests of the subgrade for every 2500 sq- ft. but not less than 3 tests in each compacted fill layer. Perform field density tests in accordance with ASTM D2922.

C. Contractor shall cooperate with the Geotechnical Engineer in the performance of the required tests.

3.07 DISPOSAL OF EXCAVATED MATERIALS

A. Legally dispose the excavated material to an off-site disposal facility, in accordance with all Local, State, and Federal Environmental regulations.

END OF SECTION 31 00 00

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 SCOPE OF WORK

A. The work under this Section includes all labor, supervision, materials and equipment necessary for the completion of all building structure excavation within the building and excavation five (5') feet outside the building for structures and utility lines, as shown on the Drawings and as specified.

B. Work shall include, but not be limited to, the following:

1. Building excavation, including pits and trenches for utilities within the building
2. Protection of utilities
3. Stockpiling of reusable materials
4. Removal of unsuitable materials
5. Rock excavation

1.3 RELATED WORK

A. Section 31 50 04 - Earthwork Protection
B. Section 31 23 24 - Structural Fill

1.4 TEST BORINGS

A. Subsurface investigations have been made at the site. This data was obtained for use in designing foundations, and is made available to all bidders solely for their information. Interpretation of subsurface data for purposes of construction is the responsibility of the Contractor.

B. There is no guarantee of the accuracy of this information, and the Owner or the Architect or the Structural Engineer shall not be responsible for any differences between the data given and the actual subsurface conditions or subsurface materials.

PART 2 - PRODUCTS - Not applicable

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavate all areas as required to perform work shown on Drawings and to conform to new finish grades. Excavations shall be to proper depth and width to allow for slabs, gravel bases and other subsequent construction.

B. Excavate to depth and lineal dimensions required to permit subsequent formwork and concrete operations to proceed without hindrance. Excavation for footings, walls, piers, grade beams, etc., must be sufficiently wide to compact all fill by mechanical means. In general, excavation shall be cut to a line eighteen (18") inches outside of the face of footings, with no undercutting permitted.

C. Surfaces of excavations shall be suitably dressed to grade noted to receive subsequent construction. Bottoms shall be substantially level, with no large projections, and free of loose material. Material at bottoms of excavation shall be undisturbed. The Engineer shall be immediately notified if material unsatisfactory for foundation bearing is encountered, for further instructions, before proceeding with work.

D. Trenches and excavations shall be of sufficient width and depth at all points to allow all pipes to be laid, joints to be formed, and structures and appurtenant construction to be built in most thorough and

workmanlike manner, and to allow for sheeting and shoring, pumping and draining. Trenches and excavations shall be at least eighteen (18") inches wider than outside dimension of structures they are to contain. Trenches for pipes must not be unnecessarily wide so as to materially increase load on pipe resulting from backfill. Bottoms of trenches and other excavations shall be carried to lines and shapes satisfactory to Engineer.

E. Completely remove all abandoned subsurface utilities, structures and existing foundations within the lines of the new building construction. Plug abandoned utility lines at least five (5') feet outside of new construction.

F. If footing bottoms are disturbed, allowed to freeze, or if excavations for footings are carried below indicated elevations shown on the Drawings, the Contractor shall notify the Engineer for instructions prior to proceeding.

3.2 PROTECTION OF UTILITIES

A. Protect existing utilities and relocate only as shown on Plans or in Specifications.

B. Notify utility companies to shut off services when required.

C. Any damage to existing drainage and utility structures to be retained shall be repaired at the Contractor's expense.

D. Maintain drainage of site and adjacent areas to prevent damage and erosion. When necessary to interrupt drainage of existing facilities, provide temporary facilities until permanent installations have been completed.

3.3 REMOVAL OF UNSUITABLE MATERIALS

A. Remove all debris subject to termite attack, rot or corrosion and all other deleterious materials from areas to be filled.

B. Remove from the interior of the building all unsuitable materials such as topsoil, loam or other organic materials.

C. Remove from site, all excavated materials not required for fill.

3.4 STOCKPILES

A. Approved excavated material suitable for fill or structural fill (i.e., clean granular material) shall be stockpiled.

3.5 ROCK EXCAVATION

A. Definition: Rock is defined as ledge, stone or hard shale, concrete, or masonry structures which require drilling or blasting for removal, and boulders larger than one (1 cy) cubic yard in volume within the building excavation and one-half (1/2 cy) cubic yard in volume encountered in trench excavations.

B. Measurement: Rock shall be stripped for measurement before proceeding, and no rock excavated or loosened before measurement will be allowed or paid for as rock. Measurement and payment therefore shall be by the number of cubic yards required to bring the excavation to the required surface or grade shown on the Drawings. In making rock excavation, eighteen (18") inches will be allowed outside the footing lines, in vertical planes; twenty-four (24") inches will be allowed outside walls without footings and outside footings where drains are required. Submit cross-sections and certification of quantities by a Connecticut Registered Land Surveyor or Professional Engineer.

C. Blasting: When explosives are used, work shall be executed by experienced powdermen or persons who are licensed or otherwise authorized to use explosives. Explosives shall be stored, handled and used in accordance with local regulations and the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Incorporated. Structural Engineer shall be notified of scheduled blasting.

Any damage to existing or new construction caused by the use of explosives shall be corrected at the Contractor's expense.

D. Shelving: If rock surfaces supporting footings should be encountered, such surfaces shall be leveled off to a slope not exceeding one inch per foot (1"/ft) unless otherwise indicated on the plans.

E. Payment: It is anticipated that no rock, as above defined, will be encountered in the construction. However, if it should be encountered, payment will be made in accordance with the Unit Prices agreed upon before rock excavation commences.

END OF SECTION 31 23 14

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PART 1 - GENERAL

1.01 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.

1.02 RELATED DOCUMENTS

A. Section 32 00 00 - General Requirements

B. Section 31 25 00 - Soil Erosion and Sediment Control

C. Section 31 00 00 - Earthwork

D. Section 32 12 16 - Asphaltic Concrete Paving

E. Section 32 13 13 - Portland Cement Concrete Paving

F. Section 32 16 13 - Curbs and Sidewalks

G. Contract Drawings and Documents

1.03 REFERENCE STANDARDS

A. 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

B. American Association of State Highway and Transportation Officials (AASHTO) - latest edition
1. T 88 Mechanical Analysis of Soils

C. All applicable OSHA Regulations

1.04 QUALITY ASSURANCE

A. An Engineer, familiar with the requirements of the Subsurface Investigation and 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 specified in Earthwork Section 31 00 00 and described herein. This inspection will not relieve the Contractor from his responsibility to complete the work in accordance with the plans and specifications.

1.05 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.

B. Submit 50-lb sample of each type of off-site fill material that is to be used in backfilling in air-tight containers to the Owner's Engineer or submit gradation and certification of aggregate material that is to be used to the Owner's Engineer for review at least one week prior to use on-site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fill material from on-site as specified in Section 31 00 00 of these Specifications and approved by the Owner's Engineer.

B. Fill material from off-site as specified in Section 31 00 00 of these specifications and approved by the Owner's Engineer.

C. Products containing materials with recycled content will be documented in accordance with the procedure outlined in the Project Documents.

D. Products containing materials manufactured and extracted, harvested or recovered within 500 miles will be documented in accordance with the procedure outlined in the Project Documents.

2.02 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 5-ton static drum weight, vibratory, smooth drum roller or as specified in the Geotechnical Report.

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

3.01 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. Overexcavate 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.

3.02 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 overexcavate beyond the elevations needed. Replacement of fill in areas overexcavated 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 that meet the requirements of Section 31 00 00 of these Specifications and 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.

3.03 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 2.02 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 specified in Section 31 00 00 of these Specifications, or 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.

3.04 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. Materials shall be tested in accordance with Section 31 00 00.

E. If compaction requirements are not complied with at any time during construction process, remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner.

F. 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.

G. Subgrade fill in paved areas shall be placed in uniform loose lifts and compacted in accordance with the Specifications.

H. 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.

I. Prior to paving, the subgrade shall be proofrolled with a minimum of 6 overlapping passes using a 5-ton static drum weight vibratory roller.

J. 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.

3.05 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.

3.06 FINISH GRADING

A. Finish grading shall be in accordance with Section 31 00 00.

3.07 QUALITY CONTROL

A. Compaction tests shall be performed by the Owner's Engineer as specified in Section 31 00 00 together with the following 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

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PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Construction dewatering.

B. Soil Erosion and Sediment Control

1.02 PERFORMANCE CRITERIA

A. Design, provide, test, operate, monitor, and maintain a dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrade.

1.03 RELATED DOCUMENTS

A. Comply with water disposal requirements of authorities having jurisdiction.

B. General Permit for Stormwater and Dewatering from Construction Activities

C. Geotechnical and Environmental Due Diligence Evaluation ‘Geotechnical Engineering Report’, prepared by Haley Aldrich dated November 2017

PART 2 - PRODUCTS

2.01 PRODUCTS

A. All pumps, hoses, electricity, erosion control measures needed.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding surrounding area.

C. Protect subgrade and foundation soils from softening and damage by rain or water accumulation.

D. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

E. Accomplish dewatering without damaging existing buildings adjacent to excavation.

3.02 DEWATERING

A. Install dewatering system using wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

B. Before excavation below ground-water level, place system into operation to lower water to specified levels and then operate it continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.

C. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner to avoid inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

D. Promptly repair damages to adjacent facilities caused by dewatering operations.

END OF SECTION 31 23 19

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 SCOPE OF WORK

A. The work under this Section includes all labor, supervision, materials and equipment necessary for the completion of all structural fill.

B. Work shall include, but not be limited to the following:

1. Structural Fill
2. Compaction
3. Testing

1.3 RELATED WORK

A. Section 31 23 14 - Structural Excavation
B. Section 31 50 04 - Earthwork Protection

1.4 SUBMITTALS

A. The Contractor shall submit for approval to the Engineer prior to commencing operations a sieve analysis, a modified proctor density test of proposed structural fill material, and drainage filter material. The tests shall be prepared by an approved testing laboratory at the Contractor's expense.

B. A sample of each approved material shall be kept at the Construction Site Field Office for comparison purposes during this phase of work.

C. Any material which does not reasonably conform to the approved sieve analysis shall be subject to removal.

1.5 FIELD INSPECTION AND TESTING

A. The Owner shall retain and pay for an independent soils laboratory to perform inspection and/or testing of structural backfill. The laboratory will have an inspector on the site during backfilling operations and will make tests required for fill and backfill placed.

B. The following field tests shall be performed:

1. One modified Proctor Density Test for each source of fill material performed in accordance with ASTM D1557.

2. Standard field density tests, each of an accuracy of plus or minus one (1%) percent.

C. Field density tests shall be at the rate of one (1) per two hundred (200 cy) cubic yards of fill, or at the discretion of the inspector. The tests shall be made at a maximum height differential of sixteen (16") inches throughout the fill.

D. It shall be the Contractor's responsibility to notify the Engineer and Testing Laboratory when each layer of fill is to be in place and ready for testing. The Contractor shall allow ample time for testing. If any fill is placed in excess of sixteen (16") inches without testing, it shall be subject to removal.

E. All required compaction and retesting due to unsatisfactory compaction shall be at the Contractor's expense.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural fill shall be clean gravel, free from foreign substances, lumps of clay, silt, loam or vegetable matter. The gravel shall be sound, tough, durable and free from thin elongated pieces. The material shall meet the following gradation requirements:

1.	Sieve Size	3 1/2"	1/4"	No. 10	No. 40	No. 100
2.	Percent Passing	100	30-65	20-55	5-30	0-5

2.2 LOCATION OF MATERIALS

A. Structural fill shall be used for all backfill under all slabs on grade, under all footings required to achieve footing base elevations for all backfill against exterior basement and retaining walls, to extend a distance of five (5') feet beyond the face, including that backfill required for structural or utility excavation and trenches within the limits of the outermost foundation walls of the building.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

A. Structural fill shall be deposited in eight (8") inch layers and compacted to the following percent optimum density (ASTM D1557):

1. Ninety-five (95%) percent under footings and under all slabs on grade, trenches, sidewalks, driveways and paved areas, against interior face of foundation walls and retaining walls.

2. Ninety (90%) percent against exterior face of foundation walls and retaining walls.

B. No material shall be compacted when its moisture content is greater than optimum.

C. The excavation must be sufficiently dry to permit complete inspection of the excavation and to permit use of compaction machinery on the initial layers of fill. The excavation must be kept sufficiently dry to carry out placement of fill and compaction thereof as specified below.

D. It shall be the responsibility of the General Contractor to notify the laboratory when excavation is complete so that inspection of conditions before filling may be made.

E. Compacting equipment shall not be of a nature so as to cause unstable conditions in the underlying natural soil.

F. No backfilling will be permitted against foundation walls until floor slabs at both top and bottom of walls have been placed and cured, or unless walls have been adequately braced. Where backfill occurs on both sides of a wall, levels of backfill on each side shall be kept approximately equal at all times.

G. Do not place structural fill or backfill on frozen material. Do not place frozen fill material.

H. If grade freezes or excavation bottom freezes, remove frozen material to extent of freezing prior to placing new structural fill or backfill material.

END OF SECTION 31 23 24

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Excavating trenches for the installation of utilities.

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.

1.02 RELATED DOCUMENTS

A. Section 31 23 19 – Dewatering

B. Section 33 11 16 – Site Water

C. Section 33 30 00 – Site Sanitary Sewers

D. Section 33 41 00 – Storm Sewers

E. Construction Documents and Drawings

F. Local Utility Company Requirements

1.03 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

1.04 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.

1.05 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.

1.06 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

2.01 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 and utility provider.

PART 3 - EXECUTION

3.01 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. Verify location, size, elevation, and other pertinent data required to make connections between existing utilities and drainage systems, and proposed construction indicated on Drawings. Coordinate all building utility connection locations and elevations with architectural plans. Contractor shall comply with all local codes and regulations.

D. Install dewatering systems that will be required to construct the proposed utilities to the design elevations and using the methods described herein. Water pumped out of excavations shall be disposed of on-site, and will not be discharged directly to the city storm drainage system.

E. 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.

3.02 EXCAVATION

A. Contact local utility companies before excavation begins. Dig trenches at proper width and depth for laying pipe, conduit, or cable and in accordance with utility company requirements. 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 inches nor more than 24 inches wider than outside surface of any pipe or conduit that is to be installed. All other trench width requirements for pipe, conduit, or cable 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, or 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.

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. Water Mains: 48-inch minimum to top of pipe barrel, or as required by the local utility company, whichever is deeper.
   2. Sanitary Sewer: 48-inch minimum to top of pipe barrel, or as required by the local utility company, whichever is deeper. Elevations and grades as indicated on Drawings.
   3. Storm Sewer: 24-inch minimum to top of pipe barrel. Elevations and grades as shown on Drawings.
   4. Electrical Conduits: 30-inch 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.
   5. Telephone Conduits: 18-inch minimum to top of conduit, or as required by the local utility company, whichever is deeper.
   6. Gas Mains and Service: 30-inch minimum to top of pipe, or as required by the local utility company, whichever is deeper.

3.03 LATERALS

A. All utilities intended to connect to services within any building will be extended to within 5 feet of the exterior face of building in the direction and elevation to connect at those geometrical locations

indicated or inferred on the drawings. All utility ends will be plugged and marked by a 2" x 4" piece of wood extending from the utility invert to 4 feet above final grade.

3.04 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.

3.05 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.

3.06 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

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Temporary and permanent soil erosion control systems.

1.02 RELATED DOCUMENTS

A. Section 02 41 13 – Site Demolition

B. Section 31 00 00 – Earthwork

C. Contract Drawings and Documents

1.03 REFERENCE STANDARDS

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

1.04 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.

1.05 ENVIRONMENTAL REQUIREMENTS

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

PART 2 - PRODUCTS

2.01 MATERIALS

A. Quick-growing grasses such as wheat, rye or oats in accordance with Contract Drawings.

B. Silt fence or silt socks as specified on the Contract Drawings.

C. Temporary mulches such as loose hay, straw, netting, wood, cellulose or agricultural silage.

D. Filter fabric as specified on the Contract Drawings, or approved equal.

PART 3 - EXECUTION

3.01 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.

3.02 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 filter fabric 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 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. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.2 SCOPE OF WORK

A. The work under this Section includes all labor, supervision, materials and equipment necessary for the completion of earthwork protection as specified.

B. Work shall include, but not be limited to, the following:

1. Protection of work and property
2. Stability of sides
3. Shoring and bracing
4. Drainage and pumping

1.3 RELATED WORK

A. Section 31 23 14 - Structural Excavation
B. Section 31 23 24 - Structural Fill

PART 2 - PRODUCTS - Not applicable

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY

A. Protect structures, utilities, sidewalks, pavements and other facilities immediately adjacent to structure excavation from damage caused by settlement, lateral movement, undermining, washout and other hazards.

B. Take precautions and provide necessary bracing and shoring to guard against movement or settlement of existing improvements or new construction. The Contractor is solely responsible for the strength and adequacy of bracing and shoring; and for the safety and support of construction from damage or injury caused by the lack thereof, of movement and/or settlement.

C. Protect excavation, trenches and all items of subsurface construction from damage by rain, water from melted snow, surface water and subsurface water. Provide all pumps, equipment, and enclosures necessary to ensure such protection.

D. Protect exposed earth and foundations in excavation areas when the atmospheric temperature is less than 35 degrees F by covering with dry insulating materials of sufficient depth to prevent frost penetration of soil.

3.2 STABILITY OF SLOPES

A. Slope the sides of excavations over five (5') feet to the angle of repose of the material excavated; otherwise, shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling by benching, shelving or bracing.

B. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfilled excavations, and when sides of excavations are subjected to vibrations from vehicular traffic or the operation of machinery or any other source.

3.3 SHORING, SHEETING AND BRACING

A. Contractor shall furnish, install in place, and maintain such sheeting, shoring, and bracing as may be

required to support sides of excavations and to prevent any movement which could in anyway injure work, diminish necessary width of trench or other excavations, or otherwise delay work or endanger adjacent structures. Sheeting shall be driven and excavation work conducted in such a manner as to prevent material in back of sheeting from running under sheeting and into trench.

B. Provide steel or timber materials for sheeting, shoring and bracing, such as sheet piling, uprights, stringers, rangers and cross-braces, in good serviceable condition. Use timbers that are sound and free of large or loose knots. Maintain shoring and bracing in excavations, regardless of the time period excavations will be open. Carry down shoring and bracing as the excavation progresses.

C. Provide trench shoring and bracing to comply with the provisions of ANSI A10.2 "Safety Code for Building Construction", and with requirements of the local codes and authorities having jurisdiction.

D. The Contractor shall, prior to driving sheeting, determine the presence and extent of underground structures as may affect the driving of sheeting.

E. Care shall be taken to prevent voids outside of sheeting; but if voids are formed, they shall be immediately filled and well rammed. Sheeting shall not be carried to such depth at manholes that it will bear upon pipe. Special precautions, by using sheeting, shoring and bracing shall be taken to guard against any damage to or settlement of buildings, walls or other structures which are adjacent to work.

F. Sheeting shall not unnecessarily be driven below structures and thereby necessitate its being left permanently in place.

G. Bracing, rangers and sheeting shall be securely fastened in place so that they cannot loosen up and fall from position. Sheeting, shoring, bracing, etc., or parts thereof, shall be removed after completion of work.

3.4 DRAINAGE AND PUMPING

A. Perform excavation in a manner to prevent surface water from flowing into the excavations, and to prevent water from flooding the project site and surrounding area. Do not allow water to accumulate in excavations. Remove water from excavations using dewatering methods which will prevent softening of foundation bottoms, undercutting of footings, and soil changes detrimental to the stability of subgrades and foundations.

B. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey the water away from excavations. Convey water removed from excavations and rain water to runoff areas. Provide and maintain temporary drainage ditches and other diversions outside the excavation limits for each structure. Do not use trench excavations for site utilities as temporary drainage ditches.

END OF SECTION 31 50 04

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work generally includes, but is not limited to, the following:

1. Soil Erosion and Sediment Control Measures
2. Earthwork
3. Placement of Compacted Fill
4. Removal of Cut
5. Rough Grading of Grass Areas
6. Construction of Storm Drainage System
7. Construction of On-Site Utilities
8. Construction of Sidewalks
9. Construction of Curbs
10. Fine Grading of Grass Areas
11. Paving of Parking Areas and Roadways
12. Striping and Signage

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 town 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 town. 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.

1.02 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, walls, 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.

1.03 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.

1.04 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.

1.05 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.

1.06 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.

1.07 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 forty-eight (48) hours in advance of commencing any work on this Contract.

E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.08 SUBMITTALS:

A. General:

1. The Contractor shall submit to the Owner's Engineer and to Town Officials and/or the Town Engineer, where required, 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 Town 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.

1.09 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 Owner and/or applicable utility companies 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, shall be based on the requirements set forth by the Owner and Construction Manager and shall be in accordance with the construction phasing plans. 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 JOB OFFICE

A. General:

1. The Contractor shall provide and maintain a suitable site trailer for the use of his supervising personnel at a location agreed upon by the Owner and/or Owner's Engineer.
2. The offices shall be equipped with two telephones listed in the Contractor's name and other appropriate facilities, including, water, heat, air conditioning, and electricity. The cost for maintaining the office facilities and the trailer shall be paid for by the Contractor for the duration of the project. The contractor shall arrange for weekly office trailer cleaning.
3. The Contractor shall provide and maintain in a neat and sanitary condition such temporary sanitary conveniences and accommodations for the use of his employees and Owner's Representative as may be necessary to comply with the requirements and regulations of the Department of Health and other governing agencies having legal jurisdiction.
4. The Contractor shall provide all security necessary and be entirely responsible for protection of equipment and materials supplied and used in conjunction with his work.
5. The office shall be maintained throughout the course of construction and shall be removed upon final acceptance of the Contract work.

1.15 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 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 Town.
2. The Contractor shall coordinate construction fencing with the Owner.

1.16 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

2.01 MATERIALS

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

PART 3 - EXECUTION

3.01 GENERAL

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

END OF SECTION 32 00 00

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparation and placement of asphaltic concrete binder course.

B. Preparation and placement of asphaltic concrete surface course.

1.02 RELATED DOCUMENTS

A. Section 31 23 16 - Excavation, Backfill, and Subgrade Preparation for Pavement

B. Section 32 16 13 - Curbs and Sidewalks

C. Section 32 17 23 - Pavement Markings

D. Connecticut Department of Transportation Standard Specifications, latest edition.

E. City of Danbury Requirements

F. Contract Drawings and Documents

G. Whereas one or more related documents are in conflict, the most stringent shall hold.

1.03 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.

1.04 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.

1.05 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 Marshall Tests for the day of installation shall be submitted to the Field Engineer with the first truck delivery each day of asphalt placement.

1.06 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/or pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 - PRODUCTS

2.01 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

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%

   Percent bitumen by weight of total mix: 5.0 - 8.5 percent
   Air voids: 3 - 6 percent
   Aggregate voids filled with asphalt cement: 70 - 82 percent
   Allowable variance of bitumen by weight of total mix = 0.4 percent

2.02 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

3.01 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.

B. Remove loose material from compacted base material surface immediately before applying prime coat.

3.02 APPLICATIONS

A. 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.

3.03 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.

3.04 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 Owner's Engineer.

END OF SECTION 32 12 16

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PART 1 - GENERAL

1.01 **SECTION INCLUDES**

A. Preparation and placement of concrete walks, concrete dumpster pad, electrical transformer pad and other concrete areas as identified on Contract Documents.

1.02 **RELATED DOCUMENTS**

A. Section 31 00 00 - Earthwork

B. Section 31 23 16 - Excavation, Backfill, and Subgrade Preparation for Pavement

C. Section 32 16 13 – Curbs and Sidewalks

D. City of Danbury requirements

E. Connecticut Department of Transportation Standard Specifications, latest edition.

F. Contract Drawings and Documents

G. Whereas one or more related documents are in conflict, the most stringent shall hold.

1.03 **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.

1.04 **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.

1.05 **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.

1.06 **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

2.01 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.

2.02 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: 4,500 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

3.01 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.

3.02 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.

3.03 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.
   2. 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.

C. 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.

D. Protect and cure finished concrete paving using acceptable moist-curing methods, more particularly described in "water-curing" section of ACI 308.

3.04 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 in accordance with Section 310000, which shall be compacted until firm and solid and neatly graded.

3.05 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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PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Preparation and Placement of Concrete Sidewalk

B. Preparation and Placement of Concrete Curb

1.02 RELATED DOCUMENTS

A. Section 31 00 00 - Earthwork.

B. Section 31 23 16 - Excavation, Backfill and Subgrade Preparation for Pavement.

C. Section 32 13 13 - Portland Cement Concrete Paving

D. Connecticut Department of Transportation Standard Specifications Latest Edition.

E. City of Danbury Requirements

F. Contract Drawing and Documents

G. Whereas one or more related documents are in conflict, the most stringent shall hold.

1.03 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.

E. City of New Haven Standard Requirements

1.04 QUALITY ASSURANCE

A. The Contractor shall warrant that concrete curb and base is 4,500 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.

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.

1.05 SUBMITTALS

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

1.06 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

2.01 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 and applicable Section 32 16 13 for concrete materials, admixtures, bonding materials, curing materials and others as required. Concrete shall have a minimum 28-day compressive strength of 4,500 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.

E. Products containing materials with recycled content will be documented in accordance with the procedure outlined in the Project Documents.

F. Products containing materials manufactured and extracted, harvested or recovered within 500 miles will be documented in accordance with the procedure outlined in the Project Documents.

G. Adhesives or sealants used for work in this section shall meet the goals of the CT HPB requirements as indicated in the Project Documents, where applicable.

2.02 MIX DESIGN AND TESTING

A. Concrete mix design and testing shall comply with requirements of ACI and Section 32 16 13 of these Specifications 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: 4,500 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

3.01 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.

3.02 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.

3.03 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, back top edge of integral curb, and formed joints with an edging took, 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.

3.04 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 in accordance with Section 31 00 00, which shall be compacted until firm and solid and neatly graded.

3.05 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

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparation and application of painted pavement markings.

1.02 RELATED DOCUMENTS

A. Contract Drawings and Documents

1.03 REFERENCE STANDARDS

A. Connecticut Department of Transportation Standard Specifications, latest edition.

B. Manual on Uniform Traffic Control Devices, latest edition.

1.04 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.01 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 be 4800 Series Traffic Paint Water Reducible Acrylic from ICI Paints or equal.
   1. Colors
      a. Yellow: 1 Gallon 20087 & 5 Gallon 20088
      b. White: 1 Gallon 25524 & 5 Gallon 22683
      c. Blue: 1 Gallon 20089 & 5 Gallon 20090
      d. Red: 1 Gallon 43613 & 5 Gallon 43614
      e. Black: 1 Gallon 26565 & 5 Gallon 26566

C. Preformed pavement markings shall be Stamark Intersection Grade Tape Series A420 as manufactured by 3M Traffic Control Materials Division, or approved equal.

PART 3 - EXECUTION

3.01 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.

3.02 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: White
2. Light Pole Bases and Site Bollards: Yellow, or as required by Owner
3. Fire Lanes: Yellow, or as required by Owner
4. Drop Off Lane: Yellow, or as required by Owner
5. Lane Striping where separating traffic moving in opposite directions: Yellow
6. Lane Striping where separating traffic moving in the same direction: White
7. Accessible Symbols: Blue or per local code and as shown on Contract Documents.
8. Accessible Sign Bollards: Blue or per local code and as shown on Contract Documents.
9. Parking Stall Striping: White or as shown on Contract Documents
10. Bus Drop Off Areas: White
11. Stop Bar: White
12. Directional Arrows: White

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

F. Exterior Paint Systems: Provide the following paint systems as indicated:
1. Parking stall, division and limit lines shall be 4" in width, true and straight. Color: White – DFT 6.0 mils.
2. Stop legends shall be as detailed on Drawing. Color: White - DFT 6.0 mils.
3. Wheelchair legends shall be as detailed on Drawing. Color: Blue. Parking stall striping shall be Blue at Handicapped stalls only - DFT 6.0 mils.
4. Diagonal striping Handicapped. Color: Blue - DFT 6.0 mils.
5. Diagonal striping Loading Zone and/or Bus Drop Off Areas. Color: White - DFT 6.0 mils.
6. Directional signage shall be as detailed on Drawing. Color: White - DFT 6.0 mils.
7. Centerline striping shall be 4" in width as detailed on Drawings. Color: White - DFT 6.0 mils.

END OF SECTION 32 17 23

PART 1 - GENERAL

1.01 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/or all necessary and required accessory items and operations.

B. Coordination of the connection of building domestic and/or fire service lines to the on-site water mains with the Building Contractor.

C. Coordination with the City of Danbury and Western Connecticut State University.

D. Sterilization and testing of new water facilities.

1.02 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. City of Danbury specifications, agreements and requirements.

A. Section 31 23 33 –Trench Excavation and Backfill for Utilities

B. Whereas one or more related documents are in conflict, the most stringent shall hold.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Ductile Iron Pipe: AWWA C151-91. Thickness Class 52 or better. Push-on joint complying with AWWA C110-90 or C153, rubber gaskets. Cement mortar lining complying with AWWA C104-90 for pipe and fittings minimum 1/16” thick. Note this type of pipe is most preferred and must be used for all lines 4” in diameter or greater.

B. 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).

C. 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.

D. 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".
10. Hydrants: Per drawings and local utility Specifications.

E. Concrete: Concrete for valve seats shall have a minimum compressive strength of 3,000 psi in 28 days.

PART 3 - EXECUTION

3.01 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 to 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 the Regional Water Authority prior to the start of water main installation work. The test shall comply with all Regional Water Authority rules and regulations.

3.02 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.

3.03 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.

3.04 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.

3.05 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.

3.06 PIPE JOINTS

A. All joints are to be made water-tight and shall be tested in accordance with the requirements of the Water Company.

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.

3.07 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.

3.08 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.

3.09 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

PART 1 - GENERAL

1.01 SCOPE

A. 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
   1. Installation of sanitary sewers consisting of manholes, pipe, grease traps, cleanouts, laterals, wye connections, and all necessary and required accessory items and operations as shown on the Details and Drawings
   2. 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.
   3. All necessary coordination with governing sewerage authority including local sewerage authority and local health department and/or Connecticut Department of Energy and Environmental Protection.
   4. Testing of sanitary sewer system
   5. Abandonment and removal of existing sanitary sewer pipes and manholes as required

1.02 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. Section 31 00 00 – Earthwork

C. Section 31 23 33 –Trench Excavation and Backfill for Site Utilities

D. Section 02 41 13–Site Demolition

E. Local Water Pollution Control Authority

F. City of Danbury Requirements

G. Whereas one or more related documents are in conflict, the most stringent shall hold.

1.03 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, invert elevations and invert locations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The Contractor shall install materials based on this specification or per the specifications of the City of New Haven or Greater New Haven Water Pollution Control Authority, whichever is more restrictive.

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. Precast Concrete Manholes: AASHTO M199-93/ASTM C478-90b, rated for H20 loading, with concrete strength of 4,000 psi.

D. Manhole Frames and Covers: Gray iron casting, AASHTO M105-93/ASTM A48, Class 30B. Pattern number as specified by the local authority or approved equal. All openings to comply with OSHA confined space access diameter. The word sewer is to be on the cover or as specified by the local sewage authority.

E. Manhole Steps: Aluminum alloy 6016T6 steps, manufactured by Alco or approved equal.

F. Cleanouts: Iron body type with extra heavy bronze plugs. Cover shall consist of Neenah Foundary Company Pattern No. R-1914 with locking cover, or approved equal.

G. Pipe joint: Rubber gasketed tongue-and-groove joints in all pipes.

PART 3 - EXECUTION

3.01 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.

3.02 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.

3.03 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.

3.04 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.

3.05 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.

3.06 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.

3.07 MANHOLES

A. General Requirements - All manholes shall be built in accordance with the Details and in the locations shown on the Drawings and as specified herein.

Structures shall be constructed of precast concrete. Precast structures will require Shop Drawing approval by the Owner's Representative and/or the Site Engineer.

No concrete shall be poured when the temperature is below 40 degrees Fahrenheit, or when indications are for lower temperatures within 24 hours, unless protection of concrete is approved by the Owner's Representative.

Manholes are to be constructed as soon as the pipe-laying reaches the location of the manhole. Should the Contractor continue his pipe-laying without making provision for completion of the manhole, the Owner's Representative shall have the authority to stop the pipe-laying operations until the manhole is completed.

Any manhole which is mislocated or oriented improperly shall be removed and rebuilt in its proper location, alignment and orientation at the Contractor's expense.

B. Foundations - All foundations shall rest on firm ground of uniform bearing.

C. Inverts - Smooth concrete invert channels shall be constructed in all manholes to insure a smooth flow of water through the structure.

The invert channels shall be carried up to the elevations shown on the Drawings and/or as approved by the Owner's Representative. Channels shall slope smoothly and evenly from the entrance pipe to the outlet pipe.

D. Frames, Covers and Gratings - Frames, covers and/or grating for manholes shall be of the type and size indicated on the Drawings or as required by the local authority. Frames shall be well bedded in mortar and shall be set accurately to the correct alignment and grade.

E. Ladder Rungs - Ladder rungs shall be installed in all manholes, spaced 12 inches on center vertically and staggered. Rungs shall be set securely in place during the construction of the masonry wall.

F. Precast Manhole - Precast manholes shall be installed only after Shop Drawings have been approved.

The base of the precast manhole shall be set on a stone base per the detail in the Contract Documents. Grout shall be placed 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.

The top grade of the precast concrete corbel section shall be set sufficiently below finished grade to permit a maximum of four and a minimum of two courses of eight inch brick to be used as risers to adjust the grade of casting. Manhole frames shall be set on a grout pad as specified herein above.

G. Bitumastic coating - The entire exterior surface of all manholes shall be coated with two coats of an approved bitumastic material to produce a dry film thickness of 0.07 inches (7 mils) per coat.

3.09 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.

3.10 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.

3.11 INSPECTION AND TESTING

A. General - The Contractor shall test the completed sewers, including manholes and 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 lest 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 maybe 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.

3.12 **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.

3.13 FINAL INSPECTION

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

PART 1 - GENERAL

1.01 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 manholes, catch basins, yard drains, pipes, cleanouts 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.

1.02 RELATED DOCUMENTS

A. Section 32 00 00 - General Requirements

B. Section 02 01 00 – Protection of Existing Utilities

C. Section 31 00 00 - Earthwork

D. Section 31 23 33 - Trench Excavation and Backfill for Utilities

E. Section 31 25 00 – Soil Erosion and Sediment Control

F. Section 32 13 13 – Portland Cement Concrete Paving

G. Local governing authority and code requirements.

H. All necessary construction permits.

I. Contract Drawings & Documents

J. City of Danbury standard requirements

K. Whereas one or more related documents are in conflict, the most stringent shall hold.

1.03 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.

1.04 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 re-inspection 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.

1.05 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, invert elevations and invert locations.

1.06 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.

1.07 COORDINATION

A. Coordinate the Work with termination of storm sewer connections outside building and connection to existing storm sewer system.

PART 2 - PRODUCTS

2.01 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: 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.

2.02 CATCH BASINS, INLETS, MANHOLES AND COMPONENTS

A. General: All manholes, catch basins and 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 forty (40) degrees Fahrenheit, or when indications are for lower temperatures within twenty-four (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. Manholes, catch basins and 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. Precast Concrete Manholes: AASHTO M199-93/ASTM C478-90b. Manhole diameter shall be selected to accommodate the inflow and outflow pipes.

F. Pour-in-place or Precast Reinforced Concrete Catch Basins (Control Structures): AASHTO M199-93/ASTM C478-90b rated for H20 loading, with minimum concrete strength of 3,000 psi. Inlet size shall be selected to accommodate the inflow and outflow pipes.

1. Manhole Barrel: Reinforced precast concrete in accordance with ASTM C478 with gaskets in accordance with ASTM C923 & C361
    a. Construct manholes of precast concrete sections as required by Contract Documents to size, shape, and depth indicated, but never less than 4-ft inside diameter.
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. Inverts: Brick or smooth concrete invert channels shall be constructed in all manholes and in all catch basins and drain inlets which do not have sumps, to insure a smooth flow of water through the structure.
6. The invert channel shall be constructed to the elevations shown on the Contract Documents and/or as approved by the Owner's Engineer. Channels shall slope smoothly and evenly from the entrance pipe to the outlet pipe.
7. Frames, Cover, and Gratings: Frames, Covers and/or gratings for manholes, catch basins, and 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.
8. Ladder Rungs: Forged Aluminum to dimensions shown on Contract Documents to be Alco steps 6061T6 or approved equal.
9. 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.
10. 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.
11. 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.
12. Provide precast manhole shaft construction with eccentric cone top section and lipped male/female rubber gasket joints or mortar joints.

13. Brick shall be new units conforming to AASHTO Designation M-91, latest revision, Grade MS.
14. Mortar shall conform to ASTM C270, Type M.
15. Pipe joints for rigid pipes shall be made with mortar, grout, gaskets, or as recommended by the pipe manufacturer.
16. Manholes and 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

3.01 EXAMINATION

A. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Contract Documents.

3.02 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.

3.03 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 unrepairable, 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.

3.04 BEDDING

A. Excavate pipe trench and place bedding material in accordance with Section 31 23 33 for work of this Section.

3.05 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. Concrete pipe over 24-inches in diameter shall be laid with the lift holes on top of the pipe. After the pipe is installed, the lift holes shall be sealed with suitable concrete plugs to the satisfaction of the Owner's Representative. 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 Sections 31 00 00 and 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.

3.06 INSTALLATION - CATCH BASINS, MANHOLES AND YARD DRAINS

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.

3.07 PLACING PRE-CAST MANHOLE BARREL SECTIONS

A. Place base pad to proper elevation and location and trowel top surface level for placement of manhole barrel.

B. Place manhole barrel plumb and level to correct elevations and anchor to base pad.
1. After completion of slab foundation the first joint of manhole barrel shall be lowered into position, grooved end first, and set level and plumb on concrete base. Align and adjust to proper grade prior to placing and forming invert which shall be poured immediately after setting of first section of manhole barrel.
2. Prior to setting subsequent manhole barrel sections, apply primer to tongue and groove ends and allow to set in accordance with manufacturer recommendations. Place "Ram-nek", or equivalent, plastic rope on tongue end. Lower next section into position, and remove excess material from interior of structure. Add additional material on exterior of joint, if necessary, for completely watertight joint.

3.08 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 pope 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.

3.09 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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 Town 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 34 10 00