



# **Volume 1 of 1 Project Manual**

**Cooling Tower Replacement  
1111 Country Club Road  
Middletown, CT  
Project No.: BI-N-341**

**Prepared By:  
BVH Integrated Services, P.C.  
50 Griffin Road South  
Bloomfield, CT  
06002**

**Melody A. Currey – Commissioner**

**State of Connecticut  
Department of Administrative Services  
Construction Services  
Office of Legal Affairs, Policy, and Procurement  
450 Columbus Boulevard, Suite 1302  
Hartford, CT 06103**




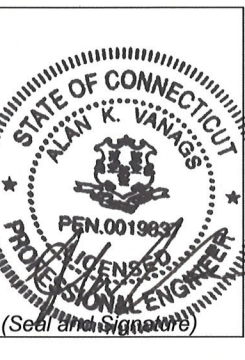


**Project Manual Date: February 2, 2018**





<b>Project Title:</b>	Cooling Tower Replacement
<b>Project Location:</b>	1111 Country Club Road, Middletown, CT 06457
<b>Project Number:</b>	BI-N-341
<b>Architect/Engineer:</b>	BVH Integrated Services, P.C., 50 Griffin Road South, Bloomfield, CT, 06002

**SEALS, SIGNATURES, AND DATES OF DESIGN PROFESSIONALS OF RECORD**

 (Seal and Signature)	<p><b>Architect Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Architect.</p> <p>_____ (Print Consultant Name)</p> <p>_____ License No.</p> <p>_____ Expiration Date</p>	 (Seal and Signature)	<p><b>Civil Engineer Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.</p> <p>_____ (Print Consultant Name)</p> <p>_____ License No.</p> <p>_____ Expiration Date</p>
 (Seal and Signature)	<p><b>Structural Engineer Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.</p> <p>KARL F. FREY _____ (Print Consultant Name)</p> <p>15290 _____ License No.</p> <p>JANUARY 31, 2019 _____ Expiration Date</p>	 (Seal and Signature)	<p><b>Electrical Engineer Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.</p> <p>ALAN K. VANAGS _____ (Print Consultant Name)</p> <p>19837 _____ License No.</p> <p>JANUARY 31, 2018 _____ Expiration Date</p>
 (Seal and Signature)	<p><b>Mechanical Engineer Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.</p> <p>ALAN K. VANAGS _____ (Print Consultant Name)</p> <p>19837 _____ License No.</p> <p>JANUARY 31, 2018 _____ Expiration Date</p>	 (Seal and Signature)	<p><b>Fire-Protection Engineer Professional Certification:</b> I hereby certify that these documents were prepared or approved by me and that I am a duly registered Professional Engineer.</p> <p>_____ (Print Consultant Name)</p> <p>_____ License No.</p> <p>_____ Expiration Date</p>

**End of Section  
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## DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

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00 01 07	Seals Page	1	<input type="checkbox"/>
00 01 10	Table of Contents	7	<input type="checkbox"/>
00 01 15	List of Drawing Sheets	1	<input type="checkbox"/>
00 11 16	Invitation to Bid	3	<input type="checkbox"/>
00 21 13	<b>NEW:</b> Instructions To Bidders	16	<input type="checkbox"/>
00 25 13	<b>NEW:</b> Pre-Bid Meeting Agenda	3	<input type="checkbox"/>
00 30 00	General Statements for Available Information	2	<input type="checkbox"/>
00 30 10	General Statement for Existing Conditions Survey		<input checked="" type="checkbox"/>
00 30 20	General Statement for Environmental Assessment Information		<input checked="" type="checkbox"/>
00 30 30	General Statement for Hazardous Building Materials Inspection and Inventory		<input checked="" type="checkbox"/>
00 30 40	General Statement for Subsurface Geotechnical Report		<input checked="" type="checkbox"/>
00 30 50	General Statement for Elevator Agreement		<input checked="" type="checkbox"/>
00 30 60	General Statement for FM Global Checklist for Roofing Systems		<input checked="" type="checkbox"/>
00 40 14	Certificate (of Authority) <i>(Bidder uploads to BizNet)</i>	2	<input type="checkbox"/>
00 40 15	CT DAS Contractor Prequalification Forms	4	<input checked="" type="checkbox"/>
00 41 00	Bid Proposal Form <i>(Bidder uploads to BizNet)</i>	9	<input type="checkbox"/>
00 41 10	<b>NEW:</b> Bid Package Submittal Requirements	4	<input type="checkbox"/>
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00 45 14	General Contractor Bidder's Qualification Statement <i>(Bidder uploads to Biznet)</i>	7	<input type="checkbox"/>
00 45 15	Objective Criteria Established for Evaluating Qualifications of Bidders	3	<input type="checkbox"/>
00 45 17	Named Subcontractor Bidder's Qualification Statement	7	<input checked="" type="checkbox"/>
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00 52 73	Subcontract Agreement Form	3	<input checked="" type="checkbox"/>
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00 73 27	Set-Aside Contractor Schedule	1	<input checked="" type="checkbox"/>
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00 92 10	Additional Forms To be Submitted After Bond Commission Funding Approval	7	<input type="checkbox"/>
00 92 30	Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors	2	<input type="checkbox"/>

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01 25 00	Substitution Procedures		<input checked="" type="checkbox"/>
01 26 00	Contract Modification Procedures		<input checked="" type="checkbox"/>
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01 31 19	Project Meetings		<input checked="" type="checkbox"/>
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01 33 00	Submittal Procedures		<input checked="" type="checkbox"/>
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01 45 00	Quality Control		<input checked="" type="checkbox"/>
01 45 23.13	Testing for Indoor Air Quality, Baseline Indoor Air Quality, and Materials		<input checked="" type="checkbox"/>
01 50 00	Temporary Facilities & Controls	6	<input type="checkbox"/>
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01 57 40	Construction Indoor Air Quality Management Plan		<input checked="" type="checkbox"/>
01 60 00	Product Requirements		<input checked="" type="checkbox"/>
01 17 00	Execution and Closeout Procedures	20	<input type="checkbox"/>
01 71 23	Field Engineering		<input checked="" type="checkbox"/>
01 73 29	Cutting and Patching		<input checked="" type="checkbox"/>
01 74 19	Construction Waste Management & Disposal		<input checked="" type="checkbox"/>
01 75 00	Starting & Adjusting		<input checked="" type="checkbox"/>
01 77 00	Closeout Procedures		<input checked="" type="checkbox"/>
01 78 23	Operation & Maintenance Data		<input checked="" type="checkbox"/>
01 78 30	Warranties & Bonds		<input checked="" type="checkbox"/>
01 80 00	Performance Requirements		<input checked="" type="checkbox"/>
01 80 13	Sustainable Design Requirements		<input checked="" type="checkbox"/>
01 91 00	Commissioning		<input checked="" type="checkbox"/>

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<b>DIVISION 10</b>	<b>SPECIALTIES</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 12</b>	<b>FURNISHINGS</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 13</b>	<b>SPECIAL CONSTRUCTION</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 20</b>	<b>RESERVED</b>	
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<b>DIVISION 21</b>	<b>FIRE SUPPRESSION</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 22</b>	<b>PLUMBING</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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23 05 53	Identification for HVAC Piping and Equipment	4
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<b>DIVISION 31</b>	<b>EARTHWORK</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 32</b>	<b>EXTERIOR IMPROVEMENTS</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 34</b>	<b>TRANSPORTATION</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 35</b>	<b>WATERWAYS AND MARINE</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 38</b>	<b>RESERVED</b>	
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<b>DIVISION 39</b>	<b>RESERVED</b>	
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<b>DIVISION 40</b>	<b>PROCESS INTEGRATION</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 41</b>	<b>MATERIAL PROCESSING</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 42</b>	<b>PROCESS HEATING, COOLING, AND DRYING</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 43</b>	<b>PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 44</b>	<b>POLLUTION CONTROL EQUIPMENT</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>DIVISION 45</b>	<b>INDUSTRY SPECIFIC MANUFACTURING EQUIPMENT</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
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<b>50 10 00</b>	<b>Existing Conditions Survey</b>		<input checked="" type="checkbox"/>
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<b>50 20 00</b>	<b>Environmental Assessment Information</b>		<input checked="" type="checkbox"/>
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<b>50 30 00</b>	<b>Hazardous Building Materials Inspection and Inventory</b>		<input checked="" type="checkbox"/>
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<b>50 40 00</b>	<b>Subsurface Geotechnical Report</b>		<input checked="" type="checkbox"/>
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<b>50 50 00</b>	<b>Elevator Agreement</b>		<input checked="" type="checkbox"/>
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<b>50 60 00</b>	<b>FM Global Checklist For Roofing Systems</b>		<input checked="" type="checkbox"/>
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	<b>Statement of Special Inspections</b>	<b>5</b>	<input type="checkbox"/>
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00 01 15	Sheet No.	List of Drawing Sheets
		Cover Sheet
S-100		Dunnage Framing Plan
M-010		Mechanical General Notes, Abbreviations, Details, and Schedule
M-100		Mechanical Floor Plans
M-200		Mechanical Part Plan and Details
E-010		Electrical Abbreviations, Symbol List, General Notes
E-100		Electrical Floor Plans

END  
SECTION 00 01 15  
LIST OF DRAWING SHEETS





Advertisement No.:	17-06-I	Advertisement Date:	March 23, 2018
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<p><b>INVITATION TO BID</b></p> <p>Connecticut Department of Administrative Services (CT DAS) Construction Services (CS) Office of Legal Affairs, Policy and Procurement 450 Columbus Blvd, Suite 1302, Hartford, CT 06103-1835</p>
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<b>Find Invitations to Bid on the State Contracting Portal:</b>	Go to the <b>DAS website</b> <a href="http://www.ct.gov/das">www.ct.gov/das</a> Click on " <a href="#">State Contracting Portal</a> "; Select " <b>Administrative Services, Construction Services</b> "; Select the appropriate <b>Invitation to Bid</b> .
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<b>Instructions for On-Line Bidding:</b>	Follow the instructions in <a href="#">6001 Construction On-line Bidding Instructions</a> . For questions, call 860-713-5794 or 860-713-5783.
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<b>Date and Time of Bid Opening:</b>	<table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td style="text-align: center;">April</td></tr> <tr><td style="text-align: center;"><i>(Month)</i></td></tr> </table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td style="text-align: center;">25</td></tr> <tr><td style="text-align: center;"><i>(Day)</i></td></tr> </table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td style="text-align: center;">2018</td></tr> <tr><td style="text-align: center;"><i>(Year)</i></td></tr> </table>	April	<i>(Month)</i>	25	<i>(Day)</i>	2018	<i>(Year)</i>	Time: <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td style="text-align: center;">1:00</td></tr> <tr><td style="text-align: center;"><i>(ET)</i></td></tr> </table> <b>PM</b>	1:00	<i>(ET)</i>
April										
<i>(Month)</i>										
25										
<i>(Day)</i>										
2018										
<i>(Year)</i>										
1:00										
<i>(ET)</i>										

<b>This Invitation to Bid is for the following Project:</b>
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<b>Construction Costs:</b>	Less Than or Equal To \$500,000
<b>Bidding Limited To:</b>	Current DAS Certified Set-Aside Contractors Only
<b>Threshold Limits: (C.G.S. §29-276b)</b>	This Project DOES NOT exceed Threshold Limits.
<b>Project Title:</b>	Cooling Tower Replacement
<b>Project Location:</b>	1111 Country Club Road Middletown, CT
<b>Project Number:</b>	BI-N-341
<b>Project Description:</b>	Replacement of an existing 350 ton cooling tower on top of an existing building.
<b>Work Includes But Is Not Limited To The Following:</b>	Complete replacement of an existing cooling tower. Removal of an existing cooling tower, piping, power and controls. Modification of existing structural framing and the addition of new structural framing to support a new cooling tower. Removal of piping and installation of new piping required for the cooling tower. Removal of electrical power and installation of new power for the cooling tower. Removal of controls and the installation of new controls for the cooling tower. Installation of new cooling tower including all piping, power, control and support. Installation of new cooling tower drain routed through/in third floor ceiling to existing sanitary stack.
<b>Date DAS Began Planning Project:</b>	12/10/2015
<b>Special Requirements:</b>	General and Mechanical Contractor Firm with minimum 10 years experience in Similar type project
<b>Cost Estimate Range:</b>	\$ 370,056.      To      \$ 409,008.
<b>Plans and Specs:</b>	Available for electronic download on the DAS <a href="#">State Contracting Portal</a>



Advertisement No.:	17-06-I	Advertisement Date:	March 23, 2018
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<b>Invitation to Bid (continued)</b>
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<b>Contract Time Allowed:</b>	<b>Calendar Days:</b>	120
<b>Liquidated Damages:</b>	\$ 866.00	Per Calendar Day Beyond Substantial Completion.
	\$ 866.00	Per Calendar Day Beyond 90 days After Substantial Completion
<b>Pre-Bid Meeting Date:</b>	April 5, 2018	
	<input type="checkbox"/>	Bidders are <b><i>strongly encouraged</i></b> to attend the Pre-Bid Meeting.
	<input checked="" type="checkbox"/>	Bidders are <b><i>required</i></b> to attend a <b>MANDATORY</b> Pre-Bid Meeting.
<b>Pre-Bid Meeting Time:</b>	10:00	<input checked="" type="checkbox"/> <b>AM</b> <input type="checkbox"/> <b>PM</b>
<b>Pre-Bid Meeting Location:</b>	1111 Country Club Road, Middletown, CT – Meet at the Security Lobby	
<b>Pre-Bid Meeting Contact:</b>	<b>DAS/CS Project Manager:</b>	Ashour Gevargisnia
	<b>Phone No.:</b>	860.713.5639
<b>Pre-Bid Meeting Registration:</b>	At the Pre-Bid Meeting, all prospective bidders shall <i>sign</i> his or her name on the <b>official roster</b> and <i>list</i> the name and address of the company he or she represents. For <b>MANDATORY</b> Pre-Bid Meetings, this shall be done no later than the designated <b>start time</b> of the Pre-Bid Meeting. <b>No</b> attendee will be allowed to register <i>after</i> the advertised start time. <b>Bids</b> submitted by contractors who have <i>not properly</i> registered and attended the <b>MANDATORY</b> Pre-Bid Meeting <i>shall be rejected</i> as <b>non-responsive</b> . See <b>Section 00 25 13 Pre-Bid Meeting Agenda</b> for additional details.	
<b>Subcontractor and/or Supplier Small Business Enterprise (SBE) &amp; Minority Business Enterprise (MBE) Set-Aside Requirements:</b>	See 00 41 00 Bid Proposal Form	
<b>Bid Proposal Submission and Other Bid Submittal Requirements:</b>	See <b>Sections 00 21 13 Instructions to Bidders, 00 41 00 Bid Proposal Form, and 00 41 10 Bid Package Submittal Requirements</b> for Bid Proposal submission requirements, including requirements for Affidavits, Certifications, Addenda, Pre-Bid Equals and Substitution Requests, and other bidding documents.	
<b>Bid Upload and Bid Opening:</b>	Bids can be uploaded and edited electronically in <a href="#">BizNet</a> <b>UNTIL 1:00 p.m.</b> on the <b>Bid Opening Date</b> and thereafter shall be locked down and publicly opened in the <a href="#">State Contracting Portal</a> .	
<b>Bid Results:</b>	Within approximately two (2) days after the Bid Opening Date, the Bid Results will be posted on the <a href="#">State Contracting Portal</a> .	
<b>Guide to the Code of Ethics For Current or Potential State Contractors (for contracts greater than \$500,000):</b>	Anyone seeking a contract with a value of more than \$500,000 shall electronically download the “ <b>Guide to the Code of Ethics For Current or Potential State Contractors</b> ” from the of Office of State Ethics (OSE) website <a href="http://www.ct.gov/ethics">www.ct.gov/ethics</a> , then click on the “ <b>Publications</b> ” link:	
<b>Prevailing Wage Rates:</b>	<p>Prevailing wages are required on this project, in accordance with the schedule provided in the bid documents, pursuant to Connecticut General Statutes Section 31-53 (a) through (h), as amended.</p> <p>Each contractor who is awarded a contract on or after October 1, 2002 shall be subject to provisions of the Connecticut General Statutes, Section 31-55a concerning annual adjustments to prevailing wages.</p> <p>Wage Rates will be posted each July 1st on the Department of Labor website <a href="http://www.ctdol.state.ct.us">www.ctdol.state.ct.us</a>. Such prevailing wage adjustment shall not be considered a matter for any contract amendment.</p>	
<b>To access Executive Orders:</b>	Go to <a href="http://www.ct.gov">www.ct.gov</a> > Governor Dannel P. Malloy > Press Room > Executive Orders.	





<b>Advertisement No.:</b>	<b>17-06-I</b>	<b>Advertisement Date:</b>	<b>March 23, 2018</b>
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**Invitation to Bid (continued)**

**IMPORTANT NOTE:** *The Commissioner of the CT Department of Administrative Services reserves the right to do any of the following without liability, including but not limited to: (a) waive technical defects in the bid proposal as he or she deems best for the interest of the State; (b) negotiate with a contractor in accordance with Connecticut General Statutes Section 4b-91; (c) reject any or all bids; (d) cancel the award or execution of any contract prior to the issuance of the "Notice To Proceed;" and, (e) advertise for new bids.*

**All Project Questions, Bid Questions, and Pre-Bid Equals and Substitution Requests must be submitted fourteen (14) Calendar Days prior to the Bid Due Date.**

All **Project Questions** and Pre-Bid **Equals and Substitution Requests** must be emailed (not phoned) to the **Architect/Engineer** with a copy to the **Construction Administrator** and the **DAS/CS Project Manager** listed below.

<b>Architect/Engineer:</b>	BVH Integrated Services, P.C.	<b>Email:</b>	kbarton@bvhintegratedservices.com
<b>Construction Administrator:</b>	CSG Construction Solution Group	<b>Email:</b>	jimg@csgroup-llc.com
<b>DAS/CS Project Manager:</b>	Ashour Gevargisnia	<b>Email:</b>	ashour.gevargisnia@ct.gov

All **Bid Questions** must be emailed to the **DAS/CS Procurement Unit Supervisor** listed below.

<b>DAS/CS Associate Fiscal Administrative Officer:</b>	Mellanee Walton	<b>Email:</b>	mellanee.walton@ct.gov
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## Instructions to Bidders

DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement

### 1.0 General Bid Proposal Information

#### 1.1 On-Line Bidding:

1.1.1 The Department of Administrative Services (DAS) Construction Services (CS) has streamlined the Bid process by allowing contractors to submit their **Bid Package Documents on line** through the **State Contracting Portal** and **BizNet**. Rather than submitting paper Bid Package Documents, contractors simply respond to an **Invitation to Bid** on the **State Contracting Portal** by retrieving and uploading their documents electronically through their **BizNet** account. Once completed, the Bid Proposal must be **electronically signed prior** to the date and time of the **Bid Opening**. See **Page 1** of the **Invitation to Bid** for the **Date and Time of the Bid Opening**.

1.1.2 All Bidders shall **electronically** upload their **Bid Package Documents** to BizNet following the **instructions** in the DAS/CS publication, [6001 Construction On-line Bidding Instructions](#), available for download here: Go to the DAS Homepage ([www.ct.gov/DAS](http://www.ct.gov/DAS)), Doing Business With The State > State Building Construction > Publications and Forms > DAS Construction Services Library > 6000 Series > **6001 Construction On Line Bidding Instructions**. For questions, call 860-713-5794 or 860-713-5783.

#### 1.2 Bid Opening:

All Bids shall be publicly opened in BizNet by the awarding authority as stated in **Section 00 11 16 Invitation to Bid**.

#### 1.3 Withdrawal of Bid:

Any **Bid** once uploaded into BizNet cannot be deleted. A Bid may only be **withdrawn** by uploading a written **Letter of Withdrawal** to BizNet using the "**Other Solicitation Document**" link **prior** to the date and time of the Bid Opening.

#### 1.4 Disqualification from Bidding:

Any contractor who violates any provision of **Connecticut General Statutes (C.G.S.) § 4b-95**, as revised, shall be **disqualified** from bidding on other contracts for a period not to exceed **twenty-four (24) months**, commencing from the date on which the violation is discovered, for each violation.

#### 1.5 Waive Minor Irregularities:

1.5.1 The awarding authority **shall** be authorized to **waive minor irregularities** which he or she 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.

1.5.2 **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.

#### 1.6 Minimum Percentage of Work:

The awarding authority **may** require in the **Bid Proposal Form** that the contractor agree to perform a stated, minimum percentage of work with its **own forces**, in accordance with **C.G.S. § 4b-95(b)**.

#### 1.7 Set-Aside Contracts:

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**.

#### 1.8 Connecticut Sales And Use Taxes:

1.8.1 **All Bidders shall** familiarize themselves with the current statutes and regulations of the **Connecticut Department of Revenue Services (DRS)**, including the Regulations of Connecticut State Agencies (R.C.S.A.) §12-426-18 and all relevant state statutes. The tax on materials or supplies exempted by such statutes and regulations shall not be included as part of a bid; see the **Contractor's Exempt Purchase Certificate (CERT-134)**, available for download from the DRS website ([www.ct.gov/drs](http://www.ct.gov/drs)).

1.8.2 The State of Connecticut construction contract has the following tax exemptions: (1) Purchasing of materials which will be physically incorporated and become a permanent part of the project; and (2) Services that are resold by the contractor. For example, if a General Contractor hires a plumber, carpenter or electrician, a resale certificate may be issued to the subcontractor because these services are considered to be integral and inseparable component parts of the building contract.

1.8.3 The following items are **not** exempt from taxes when used to fulfill a State of Connecticut construction contract: Tools, supplies and equipment used in fulfilling the construction contract.

<b>1.9 Union Labor:</b>	
Attention is called to the fact that there may or could be construction work carried on at the site by union labor. This fact must be kept in mind by all Bidders.	
<b>1.10 Rejection of Bids:</b>	
The awarding authority <i>shall reject</i> every such <b>Bid Proposal</b> , including but not limited to, the following reasons:	
<b>1.10.1</b>	A <b>Bid Proposal Form</b> that does <i>not</i> contain the signature of the bidder or its authorized representative.
<b>1.10.2</b>	A <b>Bid Proposal Form</b> that is <i>not</i> accompanied by the following documents in BizNet: <ul style="list-style-type: none"> <li><b>.1</b> <b>Section 00 43 16 Standard Bid Bond</b>, completed for <i>either</i> the <b>Bid Bond</b> option <i>or</i> <b>Certified Check</b> option;</li> <li><b>.2</b> A <b>Certified Check</b> (if applicable) delivered to the DAS/CS Office of Legal Affairs, Policy, and Procurement <i>prior</i> to the date and time of the Bid Opening;</li> <li><b>.3</b> A <b>DAS Contractor Prequalification Certificate</b> for the Bidder for Projects <i>greater</i> than <b>\$500,000</b>;</li> <li><b>.4</b> A <b>DAS Update (Bid) Statement</b> for the Bidder for Projects <i>greater</i> than <b>\$500,000</b>;</li> <li><b>.5</b> A <b>Gift and Campaign Contribution Certification – Office of Policy and Management (OPM) Ethics Form 1</b>;</li> <li><b>.6</b> A <b>Consulting Agreement Affidavit – OPM Ethics Form 5</b>. <b>NOTE: If the Bidder fails to submit or upload the Consulting Agreement Affidavit</b> required under C.G.S. § 4a-81, such bidder shall be <i>disqualified</i> and the award shall be made to the next lowest responsible qualified bidder or new bids or proposals shall be sought; and</li> <li><b>.7</b> An <b>Ethics Affidavit (Regarding State Ethics) – OPM Ethics Form 6</b>.</li> </ul>
<b>1.10.3</b>	A <b>Bid Proposal Form</b> that: <ul style="list-style-type: none"> <li><b>.1</b> Fails to <b>acknowledge</b> all <b>Addenda</b> in the space provided in the <b>Bid Proposal Form</b>;</li> <li><b>.2</b> Fails to <b>correctly list</b> the <b>Named Subcontractors</b> on the <b>Bid Proposal Form</b>;</li> <li><b>.3</b> Fails to <b>correctly state</b> a <b>Named Subcontractor's price</b> on the <b>Bid Proposal Form</b>; and</li> <li><b>.4</b> Fails to <b>list Named Subcontractors</b> who are <b>DAS Prequalified at the time of the bid</b>.</li> </ul>
<b>1.10.4</b>	A <b>Bid Proposal Form</b> that is <i>not</i> submitted on the <b>forms furnished</b> for the specific project. <b>NOTE: In no event</b> will bids or changes in bids be made by telephone, telegraph, facsimile or other communication technology except through BizNet. <b>All</b> pages of the <b>Bid Proposal Form</b> <i>must</i> be uploaded to BizNet prior to the date and time of the Bid Opening.
<b>1.10.5</b>	A <b>Bid Proposal Form</b> that has omitted items, omitted pages, added items not called for, altered the form, contains conditional bids, contains alternative bids, or contains obscure bids.
<b>1.10.6</b>	A <b>paper Bid Package</b> sent to the DAS/CS Office of Legal Affairs, Policy, and Procurement. Such bids will be returned to the bidder unopened.
<b>1.10.7</b>	<b>Any Bidder</b> that does <i>not</i> make all required <b>pre-award submittals</b> <i>within</i> the designated time period. DAS/CS <i>may</i> reject such bids as <b>non-responsive</b> .
<b>1.11 Pre-Bid Meeting:</b>	
<b>1.11.1</b>	See <b>Section 00 11 16 Invitation to Bid</b> and <b>Section 00 25 13 Pre-Bid Meeting Agenda</b> for details.
<b>1.11.2</b>	When a <b>Pre-Bid Meeting</b> is “ <b>strongly encouraged</b> ”, all attendees shall sign his or her name to the official roster and list the name and address of the company he or she represents.
<b>1.11.3</b>	When a <b>Pre-Bid Meeting</b> is <b>MANDATORY</b> , all attendees will be required to register. <b>Proper registration</b> 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 <b>MANDATORY Pre-Bid Meeting</b> . Bidders are advised to register early as <b>no</b> attendee will be allowed to register <i>after</i> the advertised start time of the <b>MANDATORY Pre-Bid Meeting</b> .  <b>All bids submitted by all contractors who have <i>not</i> properly registered and attended the <b>MANDATORY Pre-Bid Meeting</b> shall be rejected as non-responsive.</b>
<b>1.11.4</b>	<b>All Bidders Attending a Pre-Bid Meeting at a Connecticut Department of Corrections (DOC) Facility: Prior to the Pre-Bid Meeting</b> , download the “ <b>Security Background Questionnaire</b> ” from the <b>CT DOC website</b> ( <a href="http://www.ct.gov/doc">www.ct.gov/doc</a> under “ <b>Forms</b> ”), complete and submit the form as directed, and obtain approval, otherwise admission to the Pre-Bid Meeting <b>will be denied</b> . It is recommended that the approved form be brought as evidence of approval to attend the Pre-Bid Meeting.

<b>1.12 Pre-Bid Equals and Substitution Requests Procedures:</b>	
<b>1.12.1</b>	All submissions requesting "Equals and/or Substitutions" shall be made by the <b>Bidder</b> in accordance with <b>Section 01 25 00 Substitution Procedures</b> of the <b>Division 01 General Requirements and Article 15, Materials: Standards of Section 00 72 13 General Conditions</b> . Every submission shall contain all the information necessary for DAS/CS to evaluate the submission and the request. Failure to submit sufficient information to make a proper evaluation, including submittal of data for the first manufacturer listed as well as the data for the " <b>Equals and/or Substitutions</b> " proposed, shall result in a <b>rejection</b> of the submission and request. Upon receipt of the submission and request, DAS/CS shall notify the <b>Bidder</b> that the request has been received and as soon as possible shall render a decision on such submission and request.
<b>1.12.2</b>	<b>Pre-Bid-Opening Substitution of Materials and Equipment:</b> The Owner will consider requests for equals or substitutions <i>if received fourteen (14) Calendar Days prior</i> to the <b>Bid Opening Due Date</b> , as stated in the <b>Invitation To Bid</b> . The <b>Equal or Substitute Product Request (Form 7001)</b> must be used to submit requests. Download <b>Form 7001</b> from the DAS Homepage ( <a href="http://www.ct.gov/DAS">www.ct.gov/DAS</a> ) > Doing Business With The State > State Building Construction > Publications and Forms > DAS Construction Services Library > 7000 Series.
<b>1.12.3</b>	<b>Equals and/or Substitutions Requests Submittal:</b> Requests for Equals or Substitutions shall be submitted to the <b>DAS/CS Project Manager, Architect / Engineer, and Construction Administrator</b> .
<b>1.12.4</b>	<b>Substitution Request Deadline:</b> Any substitution request not complying with requirements will be denied. Substitution requests sent <b>after</b> the <b>Deadline</b> will be denied.
<b>1.12.5</b>	<b>Addendum:</b> An Addendum shall be issued to inform all prospective bidder of any accepted substitution in accordance with our addenda procedures.
<b>1.12.6</b>	<b>Time Extensions:</b> No extensions of time will be allowed for the time period required for consideration of any Substitution or Equal.
<b>1.12.7</b>	<b>Post Contract Award Substitution of Materials and Equipment:</b> All requests for "Equals and Substitutions" <b>after</b> the Award of the Contract shall be made <b>only</b> by the <b>Prime Contractor</b> for materials or systems specified that are no longer available. The requests will not be considered if the product was not purchased in a reasonable time after award, in accordance with <b>Article 15, Materials: Standards of Section 00 72 13 General Conditions</b> .
<b>1.13 Joint Ventures:</b>	
<b>1.13.1</b>	<b>Each entity</b> in a Joint Venture shall submit with the Venture's bid a <b>letter</b> on their respective company letterheads stating: <ul style="list-style-type: none"> <li>· Their <b>agreement to bid</b> as a Joint Venture with the other named Joint Venture, and set forth the <b>name and address</b> of the other Joint Venture(s).</li> <li>· The <b>respective percentage of the project work</b> that would be the responsibility of each of the Joint Ventures.</li> </ul>
<b>1.13.2</b>	<b>Prequalification: Each entity</b> in a Joint Venture shall submit its <b>Prequalification Certificate and Update (Bid Statement)</b> . <b>Each entity</b> in a Joint Venture shall be <b>prequalified</b> at the time of the bid and during the entire project construction. <b>Each entity</b> in a Joint Venture shall have the <b>prequalification single project limit</b> , and <b>remaining aggregate capacity balance</b> to meet the value of its respective percentage of the joint proposed bid.
<b>1.13.3</b>	<b>Each entity</b> in a Joint Venture shall submit <b>Section 00 45 14 General Contractor Bidder's Qualification Statement</b> .
<b>1.13.4</b>	<b>Bonding:</b> The Joint Venture shall obtain the required <b>bonding</b> from a surety for the <b>total amount</b> of the contract price.
<b>1.13.5</b>	<b>Insurance: Each entity</b> in a Joint Venture shall have the <b>required insurance coverages and limits</b> to meet the insurance requirements of the contract. The Joint Venture shall provide <b>Builder's Risk insurance</b> .
<b>1.13.6</b>	<b>Bid Submission and Contract Signing:</b> If a Joint Venture submits a bid proposal, it shall be considered to be a proposal by <b>each</b> of the Joint Ventures, jointly and severally, for the performance of the entire contract as a Joint Venture in accordance with the terms and conditions of the contract. <b>Each entity</b> in a Joint Venture is required to <b>sign the contract</b> acknowledging that each Joint Venture shall be jointly and severally liable for the performance of the entire contract.
<b>1.13.7</b>	<b>Certificate of Legal Existence: Each entity</b> in a Joint Venture shall obtain a <b>Certificate of Legal Existence</b> and submit it with the contract documents.
<b>1.14 Procedure for Alleged Violation(s) of Part II Chapter 60 of C.G.S. Bidding and Contracts:</b>	
<b>1.14.1</b>	The Regulations of Connecticut State Agencies establishes a procedure for promptly hearing and ruling on claims alleging a violation or violations of the contract bidding provisions of Part II of Chapter 60 of the Connecticut General Statutes (hereinafter "Chapter 60"). In view of the fact that time is normally of the essence in awarding construction contracts under Chapter 60, the grievance procedures are intended to be quick, informal and conclusive so as to avoid delays which can increase costs and jeopardize the very ability of the State to proceed with needed public works projects.
<b>1.14.2</b>	Download " <b>6510 Procedure for Alleged Violation(s)</b> " and " <b>6505 Petition for Alleged Violation(s)</b> " from the DAS Homepage ( <a href="http://www.ct.gov/DAS">www.ct.gov/DAS</a> ) > Doing Business With The State > State Building Construction > Publications and Forms > DAS Construction Services Library > 6000 Series > Scroll down to locate documents.

<b>1.15 Labor Market Area:</b>	
<b>1.15.1</b>	All Bidders <i>shall</i> have read <b>C.G.S. §§ 31-52 and 31-52a</b> , as revised. These sections relate to the <b>preference of State citizens</b> and the <b>preference of residents of the labor market area</b> in which the work under the contract is to be done and the <b>penalties for violations</b> thereof.
<b>1.15.2</b>	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 <b>shall</b> be required to provide the State with the following information: <ul style="list-style-type: none"> <li>.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.</li> <li>.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.</li> <li>.3 Within thirty (30) days after the start of work, the contractor <b>shall</b> 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 <b>shall</b> 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.</li> <li>.4 In the same manner as <b>Subsection 3.9.2.3</b> above, the statement <b>shall</b> indicate the steps taken to assure that the contractor and its subcontractors have sought out qualified residents of this State.</li> </ul>
<b>1.15.3</b>	The contractor <b>shall</b> cooperate with and provide information to the DAS/CS Project Manager or their designee 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.
<b>1.15.4</b>	All such information gathered and compiled by the State <b>shall</b> be forwarded to the Labor Commissioner.
<b>1.15.5</b>	<b>Pursuant to C.G.S. § 31-52b, as revised:</b> <p style="padding-left: 40px;">“The provisions of C.G.S. § 31-52 and 31-52a <b>shall not</b> 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.”</p> <p>However, no exception shall be determined to be applicable unless stated in writing by the Commissioner of the Department of Administrative Services.</p>
<b>1.15.6</b>	<b>Website Link:</b> For guidance on the CT DOL Labor Market Areas (LMA) go to the CT DOL website <a href="http://www.ctdol.state.ct.us/">http://www.ctdol.state.ct.us/</a> , under “Program Services”, click on “Labor Market information”.
<b>1.16 Executive Orders:</b>	
<b>1.16.1</b>	All Executive Orders of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. The Contract is subject to the provisions of the following: <ul style="list-style-type: none"> <li>.1 <b>Executive Order No. 3:</b> Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices;</li> <li>.2 <b>Executive Order No. 17:</b> Governor Thomas J. Meskill promulgated February 15, 1973, concerning the listing of employment openings;</li> <li>.3 <b>Executive Order No. 16:</b> Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace;</li> <li>.4 <b>Executive Order No. 14:</b> Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services; and</li> <li>.5 <b>Executive Order No. 49:</b> Governor Dannel P. Malloy, promulgated May 22, 2015, concerning the requirement for certain state contractors to disclosure campaign contributions to candidates for statewide public office or The General Assembly and to ensure convenient public access to information related to gifts and campaign contribution disclosure affidavits by state contractors.</li> </ul>
<b>1.16.2</b>	All Executive Orders are available for download from the State of Connecticut website. Go to <a href="http://www.ct.gov">www.ct.gov</a> , click on “Governor Dannel P. Malloy”, click on “Press Room”, and click on “Executive Orders”.
<b>1.17 Retaliation For Disclosure of Information:</b>	
<b>1.17.1</b>	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 <b>retaliation</b> for such employee’s <b>disclosure</b> of information to the Auditors of Public Accounts or the Attorney General under the provisions of <b>C.G.S. § 4-61dd (a)</b> , 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.
<b>1.17.2</b>	Each large state contractor shall post a <b>notice</b> of the provisions of <b>C.G.S. § 4-61dd</b> relating to large state contractors in a conspicuous place that is readily available for viewing by the employees of the contractor.



**1.18 Laws of the State of Connecticut:**

Forum and Choice of Law. The Bidder agrees that in the event it is awarded a Contract, the Bidder and the State deem the Contract to have been made in the City of Hartford, State of Connecticut. Both parties agree that it is fair and reasonable for the validity and construction of the Contract to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by Federal law or the laws of the State of Connecticut do not bar an action against the State, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Bidder waives any objection which it may now have or will have to the laying of venue of any claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

**1.19 State's Sovereign Immunity:**

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.

**2.0 Bid Proposal Form Instructions:**

**2.1 Bid Proposal Form:**

**2.1.1 All Bidders** shall upload **ALL** pages of **Section 00 41 00 Bid Proposal Form** to BizNet, prior to the date and time of the Bid Opening.

**2.2 Threshold Projects:**

**2.2.1** See **page 1** of the **Bid Proposal Form** to determine if this Project exceeds the **Threshold Limits**.

**2.2.2** If this Project exceeds Threshold Limits, **all Bidders** shall list their Firm's **Major Contractor Registration License Number** in the **Bid Proposal Form**.

**2.2.3** The **Apparent Low Bidder** shall also provide the Subcontractor(s) **Major Contractor Registration License** number(s) to the DAS/CS Office of Legal Affairs, Policy, and Procurement within **ten (10) business days after** receipt of the Letter of Intent from DAS/CS.

**2.2.4 Summary of Registration Requirements for 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 Connecticut Department of Consumer Protection (DCP). Individuals must be licensed under the requirements of **C.G.S §20-341gg "Registration of Major Contractors"**. DCP 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.

**2.2.5** The Bidder 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 DCP and obtain a **Major Contractor License** issued by DCP **PRIOR** to the date and time of the Bid Opening for this Project.

**2.2.6** For further information go to the DCP Website: <http://www.ct.gov/dcp>

**2.3 Proposed Lump Sum Base Bid, Allowances, and Contingent Work:**

**2.3.1** The proposed **Lump Sum Base Bid** shall be set forth in the space **provided on Section 00 41 00 Bid Proposal Form**.

**2.3.2** The **Proposed Lump Sum Base Bid** shall *include* all **Allowances**, all work indicated on the drawings and/or described in the specifications *except* for **Contingent Work**. See the **Bid Proposal Form, Section 01 20 00 Contract Considerations, and Section 01 23 13 Supplemental Bids** of Division 01 General Requirements for details regarding **Contingent Work**.

**2.3.3** "**Contingent Work**" includes **Unit Prices** (for Earth and Rock Excavation, Environmental Remediation, and/or Hazardous Building Materials Abatement) and **Supplemental Bids**. See **Section 01 20 00 Contract Considerations** and **Section 01 23 13 Supplemental Bids**, respectively, for applicability.

**2.3.4** The **Proposed Lump Sum Base Bid** shall be shown in *both numerical figures* and "**printed**" words **dollar amount**. In the event of any discrepancy the "**printed**" words **dollar amount** shall govern.

<b>2.4 Addenda and Interpretations:</b>	
2.4.1	The <b>Number of Addenda</b> issued by the State of Connecticut shall be set forth in the space provided on the <b>Bid Proposal Form</b> . It shall be the Bidder's responsibility to make inquiry as to, and to obtain, the Addenda issued, if any.
2.4.2	<b>Addenda</b> , if issued, will be posted on the State Contracting Portal.
2.4.3	<b>Failure to acknowledge</b> all <b>Addenda</b> in the space provided in the Bid Proposal Form <b>shall</b> be cause for <b>rejection</b> of the bid.
2.4.4	Attaching <b>Addenda</b> to the <b>Bid Proposal Form</b> does <b>not</b> constitute an acknowledgement of all Addenda and does not relieve the Bidder from the requirement for the Bidder to acknowledge all Addenda in the space provided on the Bid Proposal Form.
2.4.5	<b>No interpretations</b> of the meaning of the plans, specifications or other contract documents will be made <b>orally</b> at any time. Every <b>request</b> for such interpretation <b>shall</b> be in <b>writing</b> to the awarding authority and to be given consideration <b>shall</b> be received at least <b>fourteen (14)</b> Calendar Days <i>prior</i> to the date fixed for the opening of bids. Any and all such <b>interpretations</b> and any <b>supplemental instructions</b> will be in the form of written <b>Addenda</b> to the specifications which, if issued, will be posted on the State Contracting Portal.
2.4.6	Contractors who have subscribed through BizNet to receive daily e-mail alert notices when new Bids/RFPs are issued will be notified via a daily CT DAS " <b>Connecticut Procurement Portal Daily Notice</b> ".
<b>2.5 Bidder's Qualification Statement and Objective Criteria for Evaluating Bidders:</b>	
2.5.1	<b>All Bidders</b> shall download, complete, and upload <b>Section 00 45 14 General Contractor Bidder's Qualification Statement</b> to BizNet prior to the date and time of the Bid Opening. See BizNet for a template. This information shall be considered as part of the <b>Bid Proposal Form</b> . Failure of a Bidder to answer any question or provide required information <b>may</b> be grounds for the awarding authority to <b>disqualify</b> and <b>reject</b> the bid.
2.5.2	<b>All Bidders</b> shall comply with <b>Section 00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders</b> . The <b>Objective Criteria Established for Evaluating Qualifications of Bidders</b> are to assure that the State of Connecticut will secure the "lowest responsible and qualified bidder" who has the ability and capacity to successfully complete the Bid Proposal Form and the Work. Failure to comply with any portion of this requirement <b>may</b> cause <b>rejection</b> of the bid. <b>Note:</b> Individual Specification Sections <b>may</b> contain General Contractor and/or Subcontractor Qualification requirements that <i>exceed</i> those in <b>Section 00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders</b> .
<b>2.6 Bidder's Prequalification Requirements for Projects exceeding \$500,000:</b>	
2.6.1	<b>All Bidders</b> for Projects with <b>estimated Construction Costs greater than \$500,000</b> shall upload a current copy of their " <b>DAS Prequalification Certificate</b> " and " <b>DAS Update (Bid) Statement</b> " for the applicable <b>Class of Work</b> on <b>page 1 of Section 00 11 16 Invitation to Bid</b> to Biznet <i>prior</i> to the date and time of the Bid Opening.
2.6.2	Pursuant to <b>C.G.S. § 4b-91(a)(2)</b> and <b>C.G.S. §4a-100</b> , as revised, every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or any other public work by the state that is <b>estimated</b> to exceed <b>five hundred thousand dollars (\$500,000)</b> shall be awarded <b>only</b> to the lowest responsible and qualified Bidder who is " <b>prequalified</b> " by DAS in the <b>Class of Work for this Project</b> , as specified in <b>Section 00 11 16 Invitation to Bid</b> . No person who's <b>Contract or Subcontract</b> exceeds <b>\$500,000</b> in value may perform work as a Contractor or Subcontractor, unless the person is <b>prequalified</b> , <i>at the time of bid submission</i> , in accordance with <b>C.G.S. § 4a-100</b> , as amended, <b>C.G.S. § 4b-91(a)(2)</b> , and <b>C.G.S. §4b-91 (j)</b> . "Prequalified" includes the contractor's or substantial subcontractor's prequalification classifications, aggregate work capacity ratings and single project limits.
2.6.3	Failure to upload either the " <b>DAS Prequalification Certificate</b> " or " <b>DAS Update (Bid) Statement</b> " to Biznet prior to the date and time of the Bid Opening <b>shall</b> cause <b>rejection</b> of the bid and shall not be considered a minor irregularity under <b>C.G.S. § 4b-95</b> .
2.6.4	See <b>Section 00 40 15 CT DAS Prequalification Forms</b> for instructions on preparing and/or downloading your Firm's " <b>DAS Contractor Prequalification Certificate</b> " and " <b>DAS Update (Bid) Statement</b> ".
2.6.5	<b>Bidder's Certification:</b> Within <b>ten (10) business days after</b> receipt of the Letter of Intent from DAS/CS, the <b>Apparent Low Bidder</b> shall submit a <b>Bidder's Certification</b> certifying that the information in the bid is true, that there has been no substantial change in the Bidder's financial position or corporate structure since its most recent <b>DAS Prequalification Certificate</b> and <b>DAS Update (Bid) Statement</b> and that the bid was made without fraud or collusion with any person. See <b>Section 00 92 10 Additional Forms</b> of this Project Manual for a sample form.



<b>2.7 Named Subcontractor Requirements:</b>	
<b>2.7.1</b>	All Bid Proposals <b>shall</b> be for the complete work as specified and <b>shall</b> include the names of any Subcontractors for the <b>four (4) Classes of Work</b> specified in <b>C.G.S. § 4b-93(a)</b> , as revised, and for each other class of work for which the awarding authority has required a separate section pursuant to said subsection, together with the dollar amounts of their subcontracts. The contractor shall be selected on the basis of such bids.
<b>2.7.2</b>	The <b>Named Subcontractor Bid Price</b> shall be the price set forth in the space provided on the <b>Bid Proposal Form</b> .
<b>2.7.3</b>	No bid shall be rejected because of an error in setting forth the Name of a Subcontractor as long as the Subcontractor or Subcontractors designated are clearly identifiable.
<b>2.7.4</b>	No bid shall be rejected because the <b>Named Subcontractor's</b> plans and specifications do not accompany the bid or are not submitted with the bid.
<b>2.7.5</b>	Failure to correctly state a <b>Named Subcontractor's price</b> on the Bid Proposal Form <b>shall</b> be cause for <b>rejection</b> of the Bid.
<b>2.7.6</b>	<b>Named Subcontractor Replacement:</b> The awarding authority may require the <b>Bidder</b> to replace a <b>Named Subcontractor</b> whenever the awarding authority determines in their sole discretion that such <b>replacement</b> is in the <b>best interest of the State</b> .
<b>2.7.7</b>	<b>Named Subcontractor Substitution:</b>
.1	The awarding authority <b>shall not</b> permit <b>substitution</b> of a subcontractor for one <b>Named</b> in accordance with the provisions of <b>C.G.S. § 4b-95</b> , as revised, <b>except</b> for <b>"Good Cause"</b> .
.2	The awarding authority <b>shall not</b> permit <b>substitution</b> of a subcontractor for any designated sub-trade work bid to be performed by the Bidder's own forces in accordance with the provisions of <b>C.G.S. § 4b-95</b> <b>except</b> for <b>"Good Cause"</b> .
.3	<b>"Good Cause":</b> The term "good cause" includes but is not limited to, a subcontractor's or, <b>where appropriate, a Bidder's:</b> (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; and (7) failure to perform its agreement to execute a subcontract under C.G.S. § 4b-96, as revised.
<b>2.7.8</b>	<b>Named Subcontractor DAS Prequalification Requirement for Subcontracts exceeding \$500,000:</b>
.1	The <b>Three (3) Apparent Lowest Bidders</b> shall receive <i>VIA EMAIL</i> a "Set-Aside Contractor Schedule Request" ("Request") from the DAS/CS Office of Legal Affairs, Policy, and Procurement. For <b>Subcontracts greater than \$500,000</b> , the <b>Three (3) Apparent Lowest Bidders</b> shall submit within <b>ten (10) Calendar Days</b> after receipt of the Request current <b>DAS Prequalification Certificate(s) and Update (Bid) Statement(s)</b> for <b>each Named Subcontractor</b> in <b>Table 2.7</b> of the <b>Bid Proposal Form</b> , to the extent the <b>Class of Work</b> for the <b>Named Subcontractor</b> is a <b>Prequalification Classification</b> . This information shall be considered as part of the <b>Bid Proposal Form</b> and failure to comply with any portion of this requirement <b>may cause rejection</b> of the bid.
.2	Instructions for downloading <b>"DAS Contractor Prequalification Certificates"</b> and <b>"DAS Update (Bid) Statement"</b> can be found in <b>Section 00 40 15 CT DAS Prequalification Forms</b> .
.3	<b>In accordance C.G.S. §4b-91 (j)</b> , no person whose subcontract <i>exceeds</i> five hundred thousand dollars in value may perform work as a subcontractor on a project, which project is estimated to cost more than five hundred thousand dollars and is paid for, in whole or in part, with state funds, <i>unless, at the time of bid submission</i> , the person is prequalified in accordance with <b>C.G.S. §4a-100</b> , as amended. "Prequalified" includes the contractor's or substantial subcontractor's prequalification classifications, aggregate work capacity ratings and single project limits. For <b>Subcontracts</b> estimated to <b>exceed \$500,000</b> , the <b>Named Subcontractor must</b> be <b>"prequalified"</b> by DAS in the <b>Class of Work</b> specified in <b>Table 2.7</b> of <b>Section 00 41 00 Bid Proposal Form</b> <i>at the time of bid submission</i> , pursuant to <b>C.G.S. §4b-91(j)</b> and <b>C.G.S. § 4a-100</b> , as amended. This requirement also applies to the Bidder, if the Bidder is a Named Subcontractor.
<b>2.7.9</b>	<b>Named Subcontractor Bidder's Qualification Statements (Section 00 45 17)</b>
.1	The <b>Three (3) Apparent Lowest Bidders</b> shall receive <i>VIA EMAIL</i> a "Set-Aside Contractor Schedule Request" ("Request") from the DAS/CS Office of Legal Affairs, Policy, and Procurement. For Projects with <b>estimated Construction Costs greater than \$500,000</b> , the <b>Three (3) Apparent Lowest Bidders</b> shall submit within <b>ten (10) Calendar Days</b> after receipt of the Request completed <b>Section 00 45 17 Named Subcontractor Bidder's Qualification Statement(s)</b> of this Project Manual for <b>each Named Subcontractor</b> in <b>Table 2.7</b> of the <b>Bid Proposal Form</b> . This information shall be considered as part of the <b>Bid Proposal Form</b> and failure to comply with any portion of this requirement <b>may cause rejection</b> of the bid.
.2	<b>Important Note:</b> Individual Technical Specification Sections <b>may</b> contain qualification requirements that <b>exceed</b> those from <b>Section 00 45 17 Named Subcontractor Bidder's Qualification Statement</b> .

<b>2.7 Named Subcontractor Requirements (continued):</b>	
<b>2.7.10 Bidder Performing Work as Named Subcontractor:</b>	
.1	In accordance with <b>C.G.S. § 4b-95(c)</b> , it shall be presumed that the <b>Bidder</b> intends to perform, with its own employees, all work in such <b>four (4) Classes of Work</b> and such other classes, for which <b>no</b> Subcontractor is named in <b>Table 2.7 of the Bid Proposal Form</b> . In accordance with <b>C.G.S. § 4b-92</b> , as revised, the <b>Bidder's</b> qualifications for performing such work shall be subject to review.
.2	If the Bidder has listed itself as a <b>Named Subcontractor(s)</b> for a <b>Class(es) of Work</b> in <b>Table 2.7 of the Bid Proposal Form</b> and the proposed dollar value of the Subcontract(s) is greater than \$500,000, then <b>to the extent the Class(es) of Work is a Prequalification Classification</b> , the Bidder shall provide a current <b>DAS Prequalification Certificate</b> and <b>Update (Bid) Statement</b> for <b>each</b> of the applicable <b>Class(es) of Work</b> within ten (10) Calendar Days after receipt of the "Set-Aside Contractor Schedule Request" from DAS/CS.
<b>2.8 Set-Aside Requirements:</b>	
<b>2.8.1 Bidder's DAS Set-Aside Certificate:</b>	<b>All Small Business Enterprise (SBE) / Minority Business Enterprise (MBE) Bidders</b> shall upload a copy of their Firm's current "DAS Set-Aside Certificate" to BizNet prior to the date and time of the Bid Opening.
<b>2.8.2 All Bidders shall be required</b>	to award not less than the percentage(s) stated on <b>page 1 of Section 00 41 00 Bid Proposal Form</b> to Subcontractors who are currently certified and eligible to participate under the State of Connecticut Set-Aside Program for <b>SBE and/or MBE</b> contractors, in accordance with C.G.S. § 4a-60g. <b>Failure</b> to meet these requirements <b>shall</b> cause <b>rejection</b> of the bid. The MBE participation <b>does</b> count as part of the SBE participation.
<b>2.8.3 Set-Aside Contractor Schedule Request:</b>	The SBE/MBE participation requirement <i>must be met</i> even if the Bidder is <i>certified</i> and <i>eligible</i> to participate in the <b>Small Business Set-Aside Program</b> . To facilitate compliance with this requirement for set-aside subcontractors, the <b>Three (3) Apparent Lowest Bidders</b> shall receive <b>VIA EMAIL</b> a "Set-Aside Contractor Schedule Request" ("Request") from the DAS/CS Office of Legal Affairs, Policy, and Procurement. As directed in the Request, the <b>Three (3) Apparent Lowest Bidders</b> shall submit within <b>ten (10) Calendar Days</b> after receipt of the Request, a <b>list of certified set-aside contractors</b> to be used on this project along with the <b>dollar amounts</b> to be paid to each. (See Section 00 73 27 Set-Aside Contractor Schedule for a sample Request.)  A copy of the <b>current DAS Set-Aside Certificate</b> for <b>each</b> Subcontracted <b>SBE and/or MBE firm(s)</b> listed in the " <b>Set-Aside Contractor Schedule</b> " must be attached to the Request.  This information will be considered as part of your Bid Proposal Form and <b>failure</b> to comply with any portion of this requirement within the ten (10) days, including but not limited to <b>failure</b> to list or meet the necessary dollar amount or percentage of the bid price, will be cause to <b>reject</b> your bid.
<b>2.8.4 Percentage of Work Performed by SBE/MBE Contractors and Subcontractors:</b>	The percentage of the work performed by the SBE/MBE Contractors and Subcontractors on this project shall not be less than the percentage noted in <b>Subsection 5.1 Amount of Work Required to Be Done by "Set-Aside" Contractors</b> of <b>Section 00 73 38 Commission on Human Rights (CHRO) Contract Compliance Regulations</b> .
<b>2.8.5 To view and/or download a Set-Aside Certificate:</b>	Go to the DAS Homepage ( <a href="http://www.ct.gov/DAS">www.ct.gov/DAS</a> ) > Small and Minority Businesses > Apply for Small Business Enterprise or Minority Business Enterprise Certification (SBE or MBE) > View/Search SBE/MBE Directory.
<b>2.9 Insurance Coverages:</b>	
<b>2.9.1</b>	The Insurance coverages required for this project shall be those listed in <b>Article 35 Contractors Insurance</b> of <b>Section 00 73 13 General Conditions</b> of this Project Manual. See <b>Section 00 41 00 Bid Proposal Form</b> and <b>Section 00 62 16 Certificate of Insurance</b> of this Project Manual for additional details.
<b>2.9.2</b>	The <b>Apparent Low Bidder shall</b> submit the Firm's <b>Certificate of Liability Insurance Acord® form</b> within <b>ten (10) business days after</b> receipt of the Letter of Intent from DAS/CS.

### 3.0 All Other Required Bid Documents, Affidavits, and Certifications:

#### 3.1 Affidavits and Certifications:

##### 3.1.1 Gift and Campaign Contribution Certification – OPM Ethics Form 1: All Bidders

- .1 **All Bidders:** In accordance with Executive Order No. 49, and pursuant to C.G.S. §§ 4-250, 4-252(c) and 9-612(f)(2), as revised, 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 upload to BizNet a **Gift and Campaign Contribution Certification** prior to the date and time of the Bid Opening.
- .2 Any bidder or proposer that **does not** upload the **Gift and Campaign Contribution Certification** to BizNet prior to the date and time of the Bid Opening as required under this section shall be **disqualified** and DAS shall award the contract to the next highest ranked proposer or the next lowest responsible qualified bidder or seek new bids or proposals. Failure to upload this form to BizNet **prior** to the date and time of the Bid Opening shall not be considered a minor irregularity under CGS 4b-95.
- .3 Once uploaded, an updated **Gift and Campaign Contribution Certification** shall be uploaded within **30 days** of any changes to the submitted information.
- .4 **Annually**, on or within **two (2)** weeks of the **anniversary** date of the execution of this contract, the Contractor shall 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 DAS Commissioner signs the contract.

##### 3.1.2 Consulting Agreement Affidavit – OPM Ethics Form 5: All Bidders

- .1 **All Bidders:** Pursuant to C.G.S. §§ 4a -81a and 4a -81b, as revised, a **Consulting Agreement Affidavit** must be completed and uploaded to BizNet prior to the date and time of the Bid Opening for contracts with a value of **\$50,000** or more.
- .2 In the event that a Bidder or vendor fails or refuses to upload the **Consulting Agreement Affidavit** to BizNet prior to the date and time of the Bid Opening, as required under C.G.S. § 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. Failure to upload this form to BizNet **prior** to the date and time of the Bid Opening shall not be considered a minor irregularity under CGS 4b-95.
- .3 Once uploaded, an updated **Consulting Agreement Affidavit** shall be amended and uploaded not later than (1) **thirty (30) days** after the effective date of any such change or (2) upon the submittal of any new bid or proposal, whichever is earlier. For the purposes of this paragraph, the **execution date** of the contract will be the date the DAS Commissioner signs the contract.
- .4 Other Contributions by Individuals. Principals of Investment Services Firms, State Contractors, Principals Of State Contractors, Prospective State Contractors Or Principals Of Prospective State Contractors. Lists. Subcontracts Study. State Officials or Employees: All acquisitions, agreements and contracts are subject to the provisions of the C.G.S. § 9-612 regarding **Campaign Contribution or Contributions**.

##### 3.1.3 Ethics Affidavit – OPM Ethics Form 6: All Bidders and Apparent Low Bidder

- .1 **All Bidders:** Pursuant to C.G.S. §§ 1-101mm and 1-101qq, as revised, when DAS/CS is seeking a contract for a large state construction or procurement contract having a cost of more than **\$500,000**, DAS shall inform all potential consultant and contractor firms of the summary of state ethics laws developed by the Office of State Ethics (OSE) pursuant to C.G.S. § 1-81b. "Large State Contract" means an agreement or a combination or series of agreements between a state agency and a person, firm or corporation, having a total value of more than **\$500,000** in a calendar or fiscal year a project for the construction, alteration or repair of any public building or public work. For a **Guide to the Code of Ethics For Current or Potential State Contractors** go to the Office of State Ethics (OSE) website ([www.ct.gov/ethics](http://www.ct.gov/ethics)), then click on the "Forms" link.
- .2 **All Bidders:** Pursuant to C.G.S. § 1-101qq, as revised, DAS is also required to notify all potential consultant and contractor firms or a large state construction or procurement contract that they must upload an **Affirmation of Receipt of State Ethics Laws Summary** to BizNet prior to the date and time of the Bid Opening affirming that their key employees have read and understand the summary and agree to comply with the provisions of state ethics law.
- .3 Failure to upload this affidavit to BizNet prior to the date and time of the Bid Opening **shall** result in **rejection** of the bid and shall not be considered a minor irregularity under CGS 4b-95.
- .4 **Apparent Low Bidder:** Furthermore, the **Apparent Low 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** stating that the key personnel of the subcontractor have read, understand, and agree to comply with provisions of the state ethics laws. The **Apparent Low Bidder** shall submit such subcontractor(s) affidavits to the DAS/CS Office of Legal Affairs, Policy, and Procurement within **ten (10) business days** after receipt of the Letter of Intent from DAS/CS.

<b>3.1 Affidavits and Certifications Forms (continued):</b>	
<b>3.1.4 Iran Certification – OPM Ethics Form 7: All Bidders</b>	
.1	<b>All Bidders:</b> Pursuant to C.G.S. § 4-252a, when DAS/CS is seeking a contract for a large state construction or procurement contract having a cost of more than <b>\$500,000</b> , an <b>Iran Certification</b> must be completed and uploaded to BizNet prior to the date and time of the Bid Opening
.2	Pursuant to C.G.S. § 4-252a, <i>“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. Entities whose principal place of business is located outside of the United States are required to complete the entire form, including the certification portion of the form. United States subsidiaries of foreign corporations are exempt from having to complete the certification portion of the form. Those entities whose principal place of business is located inside of the United States must also fill out the form, but do not have to complete the certification portion of the form.”</i>
<b>3.1.5 Nondiscrimination Certification – Form A, B, C, D, or E: All Bidders</b>	
.1	<b>All Bidders:</b> Pursuant to C.G.S. §§ 4a-60 and 4a-60a, as amended, a contractor must provide an awarding State agency with written representation or documentation that certifies the contractor complies with the State's nondiscrimination agreements and warranties prior to the award of any contract with the State. A <b>Nondiscrimination Certification</b> is required for all State contracts, regardless of type, term, cost or value. The <b>appropriate form</b> must be uploaded to BizNet prior to the date and time of the Bid Opening.
.2	Once uploaded, an updated <b>Nondiscrimination Certification</b> shall be uploaded within <b>30 days</b> of any changes to the submitted information.
.3	<b>Annually</b> , on or within <b>two (2)</b> weeks of the <b>anniversary</b> date of the execution of this contract, the Contractor shall upload a completed <b>Annual Certification</b> with authorizing resolution. For the purposes of this paragraph, the execution date of the contract will be the date the DAS Commissioner signs the contract.
<b>3.1.6</b>	For instructions on how to electronically download <i>and</i> upload <b>Affidavits and Non-Discrimination Forms</b> , go to the DAS Homepage ( <a href="http://www.ct.gov/DAS">www.ct.gov/DAS</a> ) > Doing Business with the State > Create a BizNet Account for Doing Business with the State > Documents/Forms > Vendor Guide to Uploading Affidavits and Nondiscrimination Forms Online.
<b>3.2 Security For Faithful Performance:</b>	
<b>3.2.1 Certified Check or Bid Bond: All Bidders</b>	
.1	<b>All Bidders for bids in excess of \$50,000</b> shall submit <i>either</i> a <b>Certified Check</b> or a <b>Bid Bond</b> , in the form required by the awarding authority. See <b>Section 00 43 16 Standard Bid Bond</b> in BizNet for a template and important instructions regarding submitting the Bid Bond or Certified Check. Complete and upload <b>Section 00 43 16 Standard Bid Bond</b> to Biznet <b>prior</b> to the date and time of the Bid Opening for <b>either</b> the Bid Bond option <b>or</b> the Certified Check option.
.2	<b>Certified Check Option:</b> The <b>Certified Check</b> shall be drawn to the order of <b>“Treasurer, State of Connecticut”</b> , in which it is understood shall be cashed and the proceeds thereof used so far as may be necessary to reimburse the State of Connecticut for losses and damages arising by virtue of the Bidder's failure to file the required Bonds and execute the required contract if this proposal is accepted by the Awarding Authority.
.3	<b>Bid Bond Option:</b> The <b>Bid Bond</b> shall be in the form required by the awarding authority, having as <b>surety</b> thereto such surety company or companies acceptable to the DAS Commissioner and as are authorized to do business in this State, for an amount not less than 10 percent of the bid.
.4	<b>Return of Certified Check:</b> All <b>checks</b> submitted by <b>unsuccessful</b> Bidders shall be returned to them <i>after</i> the contract has been awarded.
.5	Failure to submit the Bid Bond <b>or</b> Certified Check <b>prior</b> to the date and time of the Bid Opening <b>shall</b> cause <b>rejection</b> of the bid and shall not be considered a minor irregularity under CGS 4b-95.
.6	<b>Forfeiture of Certified Check or Bid Bond:</b> <b>Failure</b> of the successful bidder to execute a contract awarded as specified and bid shall result in the <b>forfeiture</b> of the certified check or bid bond.
<b>3.2.2 Performance Bond: Apparent Low Bidder:</b>	Within <b>ten (10) business days after</b> receipt of the Letter of Intent from DAS/CS, the <b>Apparent Low Bidder shall</b> substitute for the <b>certified check</b> or <b>bid bond</b> accompanying its bid an executed <b>performance bond</b> , 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 <b>C.G.S. § 49-41</b> , as revised. See <b>Section 00 92 10 Additional Forms</b> of this Project Manual for a template.
<b>3.2.3 Labor and Material Bond: Apparent Low Bidder:</b>	Within <b>ten (10) business days after</b> receipt of the Letter of Intent from DAS/CS, the <b>Apparent Low Bidder shall</b> submit a labor and material bond in the amount not less than 100 percent of the contract price which <b>shall</b> 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 <b>shall</b> have as principal the name of the successful Bidder. This bond is to be furnished pursuant to <b>C.G.S. § 49-41</b> , as revised. See <b>Section 00 92 10 Additional Forms</b> of this Project Manual for a template.

**3.2 Security For Faithful Performance (continued):**

**3.2.4 The following section of the General Statutes of Connecticut, as revised, is inserted as information concerning this bond and will be incorporated into the Contract for the Work:**

**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.

**3.2.5 Surety Sheet: Apparent Low Bidder:** Within **ten (10) business days after** receipt of the Letter of Intent from DAS/CS, the **Apparent Low Bidder shall** submit a Surety Sheet that provides information regarding the Surety Company and Agent. See **Section 00 92 10 Additional Forms** of this Project Manual for a template.

**3.3 Certificate (of Authority):**

**3.3.1 All Bidders for bids in excess of \$50,000** shall upload a signed and scanned **Section 00 40 14 Certificate (of Authority)** to BizNet prior to the date and time of the Bid Opening. See BizNet for a template.

**3.3.2 The Apparent Low Bidder shall submit a *second* Certificate (of Authority) within ten (10) business days after** receipt of the Letter of Intent from DAS/CS.

**3.4 Security Requirements for CT Department of Correction (CT DOC) Facilities:**

**3.4.1 All Bidders for Projects at a CT DOC Facility** shall read and comply with **Section 00 73 63 CT DOC Security Requirements** for Contract Forces on CT DOC Facilities.

**3.4.2 *NEW:* All Bidders for Projects at a CT DOC Facility: Prior to the Pre-Bid Meeting, all Bidders shall download the "Security Background Questionnaire" from the CT DOC website ([www.ct.gov/doc](http://www.ct.gov/doc) , under "Forms"), complete and submit the form as directed, and obtain approval, otherwise admission to the Pre-Bid Meeting will be denied.** It is recommended that the approved form be brought as evidence of approval to attend the Pre-Bid Meeting.

**3.5 Affirmative Action Plan & Employment Information Form (DAS-45): Apparent Low Bidder**

**3.5.1 For Projects greater than \$500,000 and/or Firms with 50 or more employees, the Apparent Low Bidder shall submit the Firm's Affirmative Action Plan and Employment Information Form (DAS-45) to CHRO within fifteen (15) calendar days after** receipt of the "Request for the *Affirmative Action Plan and Employment Information Form* Letter" from DAS/CS. See **Section 00 73 38 Commission on Human Rights and Opportunities/ Contract Compliance Regulations.**

**3.5.2 The Apparent Low Bidder shall submit a copy of the Transmittal Letter to the DAS/CS Office of Legal Affairs, Policy, and Procurement within fifteen (15) calendar days after** receipt of the "Request for the *Affirmative Action Plan and Employment Information Form* Letter" from DAS/CS.



<b>3.6 Prevailing Wage: Apparent Low Bidder</b>	
3.6.1	The <b>Apparent Low Bidder</b> shall submit the “ <b>Contractor’s Wage Certification Form</b> ” to CT Department of Labor (CT DOL) within <b>fifteen (15) calendar days after</b> receipt of the “Request for the <i>Affirmative Action Plan and Employment Information Form</i> Letter” from DAS/CS. See <b>Section 00 73 44 Prevailing Wage Rates/Contractor’s Wage Certification/Payroll Certification</b> of this Project Manual.
3.6.2	Each contractor who is awarded a contract on or after October 1, 2002 shall be subject to provisions of <b>C.G.S. § 31-53, as revised</b> . See <b>Section 00 73 44 Prevailing Wage Rates/Contractor’s Wage Certification/Payroll Certification</b> of this Project Manual.
3.6.3	<b>Annual Adjustment Of Prevailing Wage Rates:</b> In determining bid price, consideration should be given to <b>C.G.S. § 31-53 and 31-55a</b> , as revised, regarding <b>annual adjustment of prevailing wage rates</b> . Annual adjustments of prevailing wage rates will <b>not</b> be considered a matter for a contract amendment.
<b>3.7 General Permit for the Discharge of Stormwater &amp; Dewatering Wastewaters from Construction Activities: Apparent Low Bidder</b>	
3.7.1	The Connecticut Department of Energy and Environmental Protection (DEEP) requires that the <i>General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities</i> (“Construction Stormwater General Permit”), and Stormwater Pollution Control Plan (SPCP) be electronically registered and uploaded to the <b>DEEP ezFile Portal</b> at least <b>sixty (60) days</b> prior to the commencement of activity involving total soil disturbance area of <b>one (1) to twenty (20) acres</b> or <b>ninety (90) days</b> prior to the commencement of activity involving a total soil disturbance area <b>greater than twenty (20) acres</b> .
3.7.2	For projects involving <b>one (1) acre or more of soil disturbance</b> , the <b>Apparent Low Bidder shall</b> set up an <b>ezFile account</b> , create a <b>Subscriber Agreement (SA)</b> , <b>assign user roles</b> , <b>electronically register</b> the Construction Stormwater General Permit, and <b>electronically upload</b> the SPCP through the DEEP <b>ezFile Portal</b> within <b>ten (10) business days after</b> receipt of the “Letter of Intent” from DAS/CS. (The Apparent Low Bidder may contact and seek assistance from the civil engineer to obtain the necessary information to register).
3.7.3	Instructions can be found on the DEEP <a href="#">Construction Stormwater General Permit</a> website. For questions, contact <a href="mailto:DEEP.Stormwaterstaff@ct.gov">DEEP.Stormwaterstaff@ct.gov</a> or call 860-424-3025 or the project’s civil engineer. <b>IMPORTANT NOTE:</b> ezFile has been optimized for <b>Google Chrome</b> .
3.7.4	The Construction Stormwater General Permit "draft" registration and SPCP are attached to the technical <b>Section 31 20 05 Sedimentation and Erosion Control</b> .
3.7.5	The Apparent Low Bidder <b>shall</b> submit a copy of the <b>DEEP confirmation email</b> (stating that the registration was successfully submitted) to the DAS/CS Office of Legal Affairs, Policy, and Procurement within <b>ten (10) business days after</b> receipt of the “Letter of Intent” from DAS/CS.
3.7.6	The Apparent Low Bidder <b>shall notify</b> the <b>DAS/CS Project Manager</b> when the DEEP sends a confirmation email (stating that the registration was successfully submitted) in order for the Owner to know when to transfer the funds to DEEP. The Owner shall be responsible for the cost of the General Permit Fee.
3.7.7	After a successful registration for the project, permit authorization “approval” can take up to <b>sixty (60) days</b> if the site has a total disturbed area of between <b>one (1) and twenty (20) acres</b> ; or <b>ninety (90) days</b> if the site has a total disturbed area <b>greater than twenty (20) acres</b> ; discharges to a tidal wetland (that is not a fresh-tidal wetland) within 500 feet of the discharge point; or is subject to the impaired waters provisions of C.G.S. Section 3(b)(12).
<b>3.8 Section 00 52 73 Subcontract Agreement Forms: Apparent Low Bidder</b>	
3.8.1	The <b>Apparent Low Bidder shall</b> submit a completed <b>Section 00 52 73 Subcontract Agreement Form</b> of this Project Manual for <b>each</b> Named Subcontractor within <b>ten (10) Business Days</b> after receipt of the “Letter of Intent” from DAS/CS. This information <b>shall</b> be considered as part of the <b>Bid Proposal Form</b> and failure to comply with any portion of this requirement <b>may cause rejection</b> of the bid.
3.8.2	Each <b>Named Subcontractor</b> shall be the matter of a <b>Subcontract</b> as required by <b>C.G.S. § 4b-96</b> .
<b>3.9 Non-Resident Contractors and Taxation: Apparent Low Bidder</b>	
3.9.1	<b>Nonresident contractors</b> must comply with the provisions <b>C.G.S. § 12-430 (7), Procedures for Nonresident Contractors</b> , and the regulations established pursuant to that section. See <b>Section 00 92 30 Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors</b> of this Project Manual for additional details.
3.9.2	<b>Apparent Low Bidder who is a Nonresident Contractor:</b> Within <b>ten (10) business days after</b> receipt of the “ <b>Letter of Intent</b> ” from DAS/CS, a certificate(s) from DRS must be provided which evidences that C.G.S. §12-430 for non-resident contractors has been met. As described in Section 00 92 30 “Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors”, <b>Verified Nonresident</b> General/Prime Contractors must submit a copy of their “ <b>Notice of Verified Status</b> ” (Verification Letter) from DRS. <b>Unverified Nonresident</b> General/Prime Contractors must submit a copy of <b>Form AU-965 “Acceptance of Surety Bond”</b> from DRS.

**3.10 Certificate of Legal Existence: Apparent Low Bidder**

**3.10.1** 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) calendar days** from the date of the contract signing must be filed with the DAS/CS Office of Legal Affairs, Policy, and Procurement within **ten (10) business days after** receipt of the "Letter of Intent" from DAS/CS.

**3.11 State Election Enforcement Commission (SEEC) Form 10: Apparent Low Bidder**

**3.11.1** The **Apparent Low Bidder** shall submit a **State Election Enforcement Commission's (SEEC) Form 10** "Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations" within **ten (10) business days after** receipt of the "Letter of Intent" from DAS/CS for contracts with a value of \$50,000 or more.

**3.11.2** Pursuant to C.G.S. § 9-612, as revised, a State Contract means an agreement or contract with the state or any state agency or any quasi-public agency 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 **in writing**, the **SEEC 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**.

**3.11.3** For instructions on how to download "**SEEC Form 10**", go to the SEEC Homepage ([www.ct.gov/seec](http://www.ct.gov/seec)); click on "Forms" at the top of the page; click on "Contractor Reporting Forms"; click on "SEEC Form 10" and follow the directions.

**3.12 OSHA Training Course: Successful Bidder**

**3.12.1** Pursuant to **C.G.S. §. 31-53b (a)**, as revised, each contract entered into 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 (\$100,000)**, shall contain a provision requiring that, not later than **thirty (30) 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 (10) 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 (10) hours** of training in accordance with 29 CFR 1910.268.

**4.0 Nondiscrimination and Affirmative Action**

This contract is subject to Federal and state laws, including Title VII of the 1964 Civil Rights Act, 42 U.S.C. § 2000e-2(a)(1), and the Connecticut Fair Employment Practices Act, C.G.S. §46a-60 et seq., prohibit various forms of discrimination and illegal harassment in employment.

**4.1 Nondiscrimination and Affirmative Action Provisions:**

**4.1.1** This section is inserted in connection with C.G.S. § 4a-60, as revised.

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

**4.1.3** C.G.S. § 4a-60, as revised:

(a) Every contract to which the state or any political subdivision of the state other than a municipality is a party shall contain the following provisions:

(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, gender identity or expression, intellectual disability, 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; and 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, gender identity or expression, intellectual disability, 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; and
- (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 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 project.
- (c) (1) Any contractor who has one or more contracts with the state or a political subdivision of the state that is valued at less than fifty thousand dollars for each year of the contract shall provide the state or such political subdivision of the state with a written or electronic representation that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section, provided if there is any change in such representation, the contractor shall provide the updated representation to the state or such political subdivision not later than thirty days after such change.
- (2) Any contractor who has one or more contracts with the state or a political subdivision of the state that is valued at fifty thousand dollars or more for any year of the contract shall provide the state or such political subdivision of the state with any one of the following:
  - (A) Documentation in the form of a company or corporate policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of such contractor that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section;
  - (B) Documentation in the form of a company or corporate policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of such contractor if (i) the prior resolution is certified by a duly authorized corporate officer of such contractor to be in effect on the date the documentation is submitted, and (ii) the head of the agency of the state or such political subdivision, or a designee, certifies that the prior resolution complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section; or

**4.1.3 - C.G.S. § 4a-60, as revised:** (continued)

- (C) Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson or other corporate officer duly authorized to adopt company or corporate policy that certifies that the company or corporate policy of the contractor complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section and is in effect on the date the affidavit is signed.
- (3) Neither the state nor any political subdivision shall award a contract to a contractor who has not provided the representation or documentation required under subdivisions (1) and (2) of this subsection, as applicable. After the initial submission of such representation or documentation, the contractor shall not be required to resubmit such representation or documentation unless there is a change in the information contained in such representation or documentation. If there is any change in the information contained in the most recently filed representation or updated documentation, the contractor shall submit an updated representation or documentation, as applicable, either (A) not later than thirty days after the effective date of such change, or (B) upon the execution of a new contract with the state or a political subdivision of the state, whichever is earlier. Such contractor shall also certify, in accordance with subparagraph (B) or (C) of subdivision (2) of this subsection, to the state or political subdivision, not later than fourteen days after the twelve-month anniversary of the most recently filed representation, documentation or updated representation or documentation, that the representation on file with the state or political subdivision is current and accurate.
- (d) For the purposes of this 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 section 1-120, (3) any other state, as defined in section 1-267, (4) the federal government, (5) a foreign government, or (6) an agency of a subdivision, agency, state or government described in subparagraph (1), (2), (3), (4) or (5) of this subsection.
- (e) For the purposes of this section, "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.

- (f) 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.
- (g) The contractor shall develop and maintain adequate documentation, in a manner prescribed by the commission, of its good faith efforts.
- (h) The contractor shall include the provisions of subsections (a) and (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 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.

## 4.2 Nondiscrimination Provisions Regarding Sexual Orientation:

**4.2.1 This section is inserted in connection with C.G.S. § 4a-60a, as revised.**

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

**4.2.3 C.G.S. § 4a-60a, as revised:**

- (a) Every contract to which the state or any political subdivision of the state other than a municipality is a party shall contain the following provisions:
  - (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) (1) Any contractor who has one or more contracts with the state or a political subdivision of the state that is valued at less than fifty thousand dollars for each year of the contract shall provide the state or such political subdivision of the state with a written representation that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section.
- (2) Any contractor who has one or more contracts with the state or a political subdivision of the state that is valued at fifty thousand dollars or more for any year of the contract shall provide the state or such political subdivision of the state with any of the following:
  - (A) Documentation in the form of a company or corporate policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of such contractor that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section;
  - (B) Documentation in the form of a company or corporate policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of such contractor if (i) the prior resolution is certified by a duly authorized corporate officer of such contractor to be in effect on the date the documentation is submitted, and (ii) the head of the agency of the state or such political subdivision, or a designee, certifies that the prior resolution complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section; or
  - (C) Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson or other corporate officer duly authorized to adopt company or corporate policy that certifies that the company or corporate policy of the contractor complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section and is in effect on the date the affidavit is signed.

- (3) Neither the state nor any political subdivision shall award a contract to a contractor who has not provided the representation or documentation required under subdivisions (1) and (2) of this subsection, as applicable. After the initial submission of such representation or documentation, the contractor shall not be required to resubmit such representation or documentation unless there is a change in the information contained in such representation or documentation. If there is any change in the information contained in the most recently filed representation or updated documentation, the contractor shall submit an updated representation or documentation, as applicable, either (A) not later than thirty days after the effective date of such change, or (B) upon the execution of a new contract with the state or a political subdivision of the state, whichever is earlier. Such contractor shall also certify, in accordance with subparagraph (B) or (C) of subdivision (2) of this subsection, to the state or political subdivision, not later than fourteen days after the twelve-month anniversary of the most recently filed representation, documentation or updated representation or documentation, that the representation on file with the state or political subdivision is current and accurate.
- 4) For the purposes of this section, "contract" includes any extension or modification of the contract, and "contractor" includes any successors or assigns of the contractor. For the purposes of this section, "contract" does not include a contract where each contractor is (A) a political subdivision of the state, including, but not limited to, a municipality, (B) a quasi-public agency, as defined in section 1-120, (C) any other state, as defined in section 1-267, (D) the federal government, (E) a foreign government, or (F) an agency of a subdivision, agency, state or government described in subparagraph (A), (B), (C), (D) or (E) of this subdivision.
- (c) The contractor shall include the provisions of subsection (a) 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 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.

**End of Section**  
**00 21 13 Instructions to Bidders**



## Pre-Bid Meeting Agenda:

DAS ● Construction Services ● Office of Legal Affairs, Policy, and Procurement

### 1.0 Pre-Bid Meeting:

<b>1.1</b>	<b>The Owner, and Engineers will conduct a Pre-Bid Meeting.</b> <b>For the Pre-Bid Meeting Date, Time, and Location see Section 00 11 16 Invitation To Bid for this Specific Bid.</b>
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#### 1.2 Attendance:

<b>1.2.1</b>	<b>General Contractor:</b>	Attendance at the Pre-Bid Meeting is MANDATORY.
<b>1.2.2</b>	<b>Subcontractors:</b>	Attendance at the Pre-Bid Meeting is recommended.
<b>1.2.3</b>	<b>Pre-Bid Meeting Sign-in Sheet:</b>	It is MANDATORY that all attendees sign the <b>Pre-Bid Meeting Sign-in Sheet</b> .

#### 1.3 Bidder Questions:

<b>1.3.1</b>	Submit <b>written</b> questions to be discussed at the Pre-Bid Meeting a <b>minimum of two (2) Calendar Days prior</b> to Pre-Bid Meeting date. See the <b>Invitation to Bid</b> for instructions on submitting questions.
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### 2.0 Pre-Bid Meeting Agenda:

The Pre-Bid Meeting Agenda will include a review of topics, **as applicable to the Project**, which may affect proper preparation and submittal of bids, including, but not limited to, the following:

#### 2.1 Procurement and Contracting Requirements:

<b>2.1.1</b>	<b>Section 00 11 16 – Invitation to Bid</b>
<b>2.1.2</b>	<b>Section 00 21 13 – Instructions to Bidders</b>
<b>2.1.3</b>	<b>Section 00 41 00 – Bid Proposal Form</b>
<b>2.1.4</b>	<b>Section 00 41 10 – Bid Package Submittal Requirements</b>
<b>2.1.5</b>	<b>Section 00 30 00 – General Statements for Available information</b>
<b>2.1.6</b>	<b>Division 50 – Project-Specific Available Information</b>
<b>2.1.7</b>	<b>Bonding</b>
<b>2.1.8</b>	<b>Insurance</b>
<b>2.1.9</b>	<b>Bid Security</b>
<b>2.1.10</b>	<b>Notice of Award</b>



**2.0 Pre-Bid Meeting Agenda (continued):**

**2.2 Communication During Bidding Period:**

- 2.2.1 **Obtaining Bid Documents**
- 2.2.2 **Access to DAS Website, BizNet, and State Contracting Portal**
- 2.2.3 **Bidder's Requests for Information:** See General Requirements Sections 01 26 00
- 2.2.4 **Substitution Procedures (Prior to Bid):** See General Requirements Section 01 25 00
- 2.2.5 **Substitutions following Contract Award:** See General Requirements Section 01 25 00
- 2.2.6 **Addenda Procedures:** See Item No. 2.8 of this form

**2.3 Contract Considerations:**

- 2.3.1 **Allowances:** See General Requirements Section 01 20 00
- 2.3.2 **Unit Prices:** See General Requirements Sections 01 20 00
- 2.3.3 **Supplemental Bid:** See General Requirements Section 01 23 13 or 01 20 00, as applicable

**2.4 Construction Documents:**

- 2.4.1 **Summary of Work:** See General Requirements Section 01 11 00
- 2.4.2 **Temporary Facilities and Controls:** See General Requirements Section 01 50 00
- 2.4.3 **Work Sequence:** See General Requirements Section 01 11 10 or 01 12 16, as applicable
- 2.4.4 **Contractor Use of Premises:** See General Requirements Section 01 11 00  
*Or (as applicable)*  
**Work Restrictions:** See General Requirements Section 01 14 00

**2.5 Separate Contracts:**

- 2.5.1 **Work by Owner**
- 2.5.2 **Work of Other Contracts**

**2.6 Project Schedule:**

- 2.6.1 **Project Schedule**
- 2.6.2 **Contract Time**
- 2.6.3 **Liquidated Damages**
- 2.6.4 **Other Bidder Questions**

**2.7 Site/Facility Visit or Walkthrough:**

- 2.7.1  **A Site/Facility Visit or Walkthrough is scheduled for the Pre-Bid Meeting**
- 2.7.2  **A Site/Facility Visit or Walkthrough is NOT scheduled for the Pre-Bid Meeting**

**2.8 Post Pre-Bid Meeting Addendum:**

- 2.8.1 **No Interpretations** of the meaning of the plans, specifications or other contract documents will be made orally at any time. Every bidder **request** for such interpretation **shall** be in writing to the awarding authority and to be given consideration **shall** be received at least **fourteen (14)** Calendar Days **prior** to the Bid Due Date. 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 State Contracting Portal.



**3.0 Pre-Bid Meeting Minutes:**

**3.1 Recording and Distribution of Pre-Bid Meeting Minutes:**

3.1.1 The Owner, and Engineer is responsible for conducting the Pre-Bid Meeting and will record and distribute meeting minutes to attendees and others known by the issuing office to have received a complete set of Procurement and Contracting Documents.

**3.2 Pre-Bid Meeting Minutes as “Available Information”**

3.2.1 Minutes of the Pre-Bid Meeting are issued as “Available Information” and **do not** constitute a modification to the Procurement and Contracting Documents. **Modifications to the Procurement and Contracting Documents are issued by written Addendum only.**

**3.3 Pre-Bid Meeting Sign-in Sheet:**

3.3.1 Minutes will include the list of meeting attendees.

**3.4 List of Planholders:**

3.4.1 Minutes will include the list of planholders.

**End of Section  
00 25 13 Pre-Bid Meeting Agenda**





**00 30 00 GENERAL STATEMENTS FOR AVAILABLE INFORMATION NOT USED**

- A. **Summary:** This Section is not a Bidding Document, but directs Bidders to **Division 50 00 00 Project-Specific Available Information** that provides project-specific information available for review by Bidders.
- B. **Bidder Responsibility:** The Bidder is responsible for information, including but not limited to, any interpretations and opinions of information contained in any plans, reports, evaluations, and logs, or shown on any drawings, or indicated on any drawings. **Division 50 00 00 Project-Specific Available Information** is provided to Bidders for their use in the preparation of a Bid.
- C. **Measurement:** **Division 50 00 00 Project-Specific Available Information** shall be utilized for determination of payment for the Work during construction of the project.
- D. **Payment:** No separate payment will be made for any Work under **Division 50 00 00 Project-Specific Available Information**.
- E. **Related Sections:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section. **See Division 50 00 00 Project-Specific Available Information** for information that is available for this Project.
- F. Please read the following **General Statement(s)** that describe the type of project-specific information that is available in **Division 50 00 00 Project-Specific Available Information**:

00 30 00	General Statements For Available Information Table Of Contents	Not Used
00 31 19.26	General Statement for Existing Conditions Survey	<input checked="" type="checkbox"/>
00 31 24.13	General Statement for Environmental Assessment Information	<input checked="" type="checkbox"/>
00 31 26.23	General Statement for Hazardous Building Materials Inspection and Inventory	<input checked="" type="checkbox"/>
00 31 32.13	General Statement for Subsurface Geotechnical Report	<input checked="" type="checkbox"/>
00 31 33.11	Elevator Agreement	<input checked="" type="checkbox"/>
00 31 33.15	FM Global Checklist for Roofing Systems	<input checked="" type="checkbox"/>
	Statement of Special Inspections	<input type="checkbox"/>

**00 31 19.26 GENERAL STATEMENT FOR EXISTING CONDITIONS SURVEY Not Used**

**00 31 24.13 GENERAL STATEMENT FOR ENVIRONMENTAL ASSESSMENT INFORMATION Not Used**

**1. Soil Contamination Report: Not Used**

**2. Groundwater Contamination Report: Not Used**

**00 31 26.23 GENERAL STATEMENT FOR HAZARDOUS BUILDING MATERIALS INSPECTION AND INVENTORY Not Used**

**1. Work Involving Asbestos Containing Material (ACM): Not Used**

**2. Work Involving Lead-Based Paint (LBP): Not Used**



3. Work Involving Polychlorinated Biphenyls (PCBs) in Building Materials: Not Used

4. Work Involving Mold: Not Used

5. Work Involving Universal Wastes  
(Products Containing Persistent Bioaccumulative Toxic Chemicals (PBT's)): Not Used

00 31 32.13 GENERAL STATEMENT FOR SUBSURFACE GEOTECHNICAL REPORT Not Used

00 31 33.11 ELEVATOR AGREEMENT Not Used

00 31 33.15 GENERAL STATEMENT FOR FM GLOBAL CHECKLIST FOR ROOFING SYSTEMS Not Used

STATEMENT OF SPECIAL INSPECTIONS Not Used

A. Related Documents:  
Statement of Special Inspections

B. Description of Work:

1. Special Inspections for Structural Systems indicated in Div 50 00 00 project specific available information, Statement of Special Inspections.

End of Section  
00 30 00 General Statements for Available Information



**Certificate (of Authority)**

**DAS Construction Services Project No.:**

I  ,   
 (Signer's Name)<sup>1</sup> (Signer's Title)

of  , an entity lawfully organized and existing under the laws  
 (Name of Entity)

of  , do hereby certify that the following is a true and correct  
 (Name of State or Commonwealth)

copy of a resolution adopted on the  day of  , 20  by the governing body of  
 (Day)<sup>2</sup> (Month)<sup>2</sup> (Year)<sup>2</sup>

, in accordance with all of its documents of governance and  
 (Name Of Entity)

management and the laws of  and further certify that such resolution has not  
 (Name of State or Commonwealth)

been modified, rescinded or revoked, and is at present in full force and effect.

**RESOLVED:** that  ,   
 (Name of Signer of Contract Documents)<sup>3</sup> (Title of Signer of Contract Documents)<sup>3</sup>

of  is empowered and authorized, on behalf of the entity,  
 (Name of Entity)

to execute and deliver contracts and amendments thereto, and all documents required by the Governor, the Connecticut Department of Administrative Services, the Connecticut State Properties Review Board and the Office of the Attorney General associated with such contracts and amendments.

IN WITNESS WHEREOF, the undersigned has executed this certificate this  day of  , 20  .  
 (Day)<sup>4</sup> (Month)<sup>4</sup> (Year)<sup>4</sup>

(Signature)

(Print Name)

(Title)

**Reference Notes:**

- 1 The signer of this certificate must be someone *other than* the signer of the contract documents *except for* a sole managing member of an LLC or the sole officer or sole principal of a corporation. *If* the signer is a sole managing member of an LLC, *then* along with this certificate the signer must provide a letter on company letterhead that indicates the signer is a sole member and managing member. If the signer is the sole officer or sole principal of a corporation, then the signer must provide with the certificate a letter on company letterhead setting forth this fact.
- 2 This date must be on or before the **date of signing** of the Bid Proposal (or Contract).
- 3 This person shall sign the Contract and other required documents.
- 4 This date must be on or after the **date of signing** of the Bid Proposal (or Contract).

**For Your Information:**

**Certificate (of Authority)**

**All Bidders:**

**Complete page 1, print, sign, and scan to PDF. Upload the PDF form to BizNet.**

What the **Certificate** is saying is that the organization authorized the signatory to sign the pertinent **documents other than** the Certificate (of Authority) and that, as of the date of **execution** of the CERTIFICATE (i.e., the date set forth in the "In Witness Whereof" blanks) there has been no change in that authorization.

**Instructions For Completing The Certificate (of Authority)**

**The Certificate (of Authority) to Accompany the Bid Proposal Form:**

**1. 1<sup>st</sup> Paragraph:**

- 1.1 First, enter the name and title of the individual signing the Certificate (of Authority).
- 1.2 Second, enter the legal name of the entity (exactly as it is shown on the Secretary of State registry).
- 1.3 Third, enter the name of the state or commonwealth the entity is registered in.
- 1.4 Fourth, enter the date the resolution was adopted by the governing body. This **date** is **on** or **before** the date the **Bid Proposal** is signed.
- 1.5 Fifth, enter the name of the state or commonwealth the entity is registered in.

**2. 2<sup>nd</sup> Paragraph:**

- 2.1 First, enter the name and title of the individual signing bid documents for the entity.
- 2.2 Second, enter the legal name of the entity (exactly as it is shown on the Secretary of State registry).

**3. Last Paragraph:**

- 3.1 Enter the **Witness Date**<sup>1</sup>. This date will likely be the date of execution of the **Bid Proposal form**.

<sup>1</sup> ***This Witness Date Should Not Be Before The Date Of Execution Of The Bid Proposal.***

**The Certificate (of Authority) to Accompany the Contract:**

**1. 1<sup>st</sup> Paragraph:**

- 1.1 First, enter the name and title of the individual signing the Certificate (of Authority).
- 1.2 Second, enter the legal name of the entity (exactly as it is shown on the Secretary of State registry).
- 1.3 Third, enter the name of the state or commonwealth the entity is registered in.
- 1.4 Fourth, enter the date the resolution was adopted by the governing body. This **date** is **on** or **before** the date the **Contract** is signed.
- 1.5 Fifth, enter the name of the state or commonwealth the entity is registered in.

**2. 2<sup>nd</sup> Paragraph:**

- 2.1 First, enter the name and title of the individual signing contract documents for the entity.
- 2.2 Second, enter the legal name of the entity (exactly as it is shown on the Secretary of State registry).

**3. Last Paragraph:**

- 3.1 Enter the **Witness Date**<sup>1</sup>. This date will likely be the date of execution of the **Contract**.

<sup>1</sup> ***This Witness Date Should Not Be Before The Date Of Execution Of The Contract.***

**End of Section 00 40 14 Certificate (of Authority)**

## Bid Proposal Form

DAS ● Construction Services ● Office of Legal Affairs, Policy, and Procurement  
 450 Columbus Boulevard, Suite 1302 ● Hartford, CT 06103

<b>Date and Time of Bid Opening:</b>	See page 1 of Section 00 11 16 Invitation To Bid.
<b>Instructions for On-Line Bidding:</b>	Follow the instructions in <a href="#">6001 Construction On-line Bidding Instructions</a> . For questions, call 860-713-5794 or 860-713-5783.

- Instructions for Completing This Bid Proposal Form:**
- Download** and **save** the Bid Proposal Form to your computer. Close the form. Open your *saved* Bid Proposal Form and type required information in blue boxes. (Remember to keep saving to your computer.)
  - On your Word Toolbar, **click “View” then “Edit Document” or “Print Layout”** in order to edit the form.
  - When your Bid Proposal Form is complete, perform a final “save” to your computer! **Print ALL** pages and **sign** your Bid Proposal Form. **Scan ALL** pages of your Bid Proposal Form to **PDF**. Upload the **PDF** Bid Proposal Form to BizNet.
  - Duly Authorized Signature:** A duly authorized representative of the Bidder or Bidder’s partnership, firm, corporation or business organization must sign the Bid Proposal Form.
  - No Facsimile Signature** is permitted. **All information below** is to be filled in by the **Bidder**.
  - If an Addendum is issued that **changes** the **Bid Proposal Form** then the **Revised Bid Proposal Form** (issued with the Addendum) **must** be uploaded instead.
  - Upload to BizNet **only** the additional **Bid Package Documents** as described in **Table 1** of **Section 00 41 10 Bid Package Submittal Requirements**.
  - A signed and scanned **Certificate (of Authority), Section 00 40 14**, **must** be uploaded to Biznet **prior** to the date and time of the Bid Opening.
  - Any Bid Proposal Form** that has omitted or added items, altered the form, contains conditional, alternative, or obscure bids, or is submitted *without* the signature of the bidder or its authorized representative, **will be rejected**.
  - See **Section 00 21 13 Instructions to Bidders** for additional information.

<b>1.0 General Bid Proposal Information:</b>	
<b>Construction Costs:</b>	Less Than or Equal To \$500,000
<b>Bidding Limited To :</b>	Current DAS Certified Set-Aside Contractors Only
<b>Threshold Limits: (C.G.S. §29-276b)</b>	This Project DOES NOT exceed Threshold Limits.
<b>Set Aside Requirements:</b>	SBE Subcontractors and/or Suppliers: None Required; MBE Subcontractors and/or Suppliers: Good Faith Effort
<b>Project Title:</b>	Cooling Tower Replacement
<b>Project Location:</b>	1111 Country Club Road Middletown, CT
<b>Project Number:</b>	BI-N-341
<b>Pre-Bid Meeting:</b>	See <b>Section 00 11 16 Invitation to Bid</b> and <b>Section 00 25 13 Pre-Bid Meeting</b> .
<b>Plans and Specifications prepared by A/E:</b>	BVH Integrated Services, P.C., 50 Griffin Road South, Bloomfield, CT

**1.1 Commencement and Acceptance:** (See Section 00 73 13 General Conditions, Article 4 - Commencement and Progress of Work and Article 1 - Definitions)

The Selected Bidder shall commence Work within **fourteen (14) Calendar Days** after receiving a “**Construction Start Date and Notice to Proceed**” by the Commissioner or authorized representative and continue for 

120
90

**Calendar Days** for “**Substantial Completion**” of the project; and then continue 

90
----

**Calendar Days** for “**Acceptance**” of the Work.

**1.2 Liquidated Damages:** (See Section 00 73 13 General Conditions, Article 8 – Damages & Article 1 - Definitions)

**1.2.1 Liquidated Damages – Substantial Completion:**

The Selected Bidder shall be assessed \$ 

866.00
--------

 per **Calendar Day** beyond the date established for Substantial Completion of the Contract according to the **Contract Time** as defined in **Article 1.28 of Section 00 73 13 General Conditions**, and not otherwise excused or waived pursuant to the Contract Documents, as defined in **Article 1.23 of Section 00 73 13 General Conditions**.

**1.2.2 Liquidated Damages – Acceptance:**

The Selected Bidder shall be assessed \$ 

866.00
--------

 per **Calendar Day** beyond ninety (90) days after the date of said Substantial Completion that the Selected Bidder fails to achieve **Acceptance**, as defined in **Article 1.1 of Section 00 73 13 General Conditions** and not otherwise excused or waived as described above.

**1.3 Bid Proposal Statements and Conditions:** This **Bid Proposal Form** shall be submitted according to, and in compliance with, the foregoing and following statements, conditions, and/or information:

**1.3.1** This Bid Proposal Form is submitted in accordance with Chapter 60 Construction And Alterations Of State Buildings, Part II Bidding And Contracts of the Connecticut General Statutes (C.G.S.), as amended, particularly C.G.S. § 4b-91(a)(5)(A) – (C), and pursuant to, and in compliance with, the **Invitation to Bid** (Section 00 11 16), the **Instructions to Bidders** (Section 00 21 13), the **Bid Package Submittal Requirements** (Section 00 41 10), and the **Contract** (Section 00 52 03).

**1.3.2** The Bidder proposes to furnish the labor and/or materials, installed as required for the Project named and numbered on this **Bid Proposal Form**, submitted herein, furnishing all necessary equipment, machinery, tools, labor and other means of construction, and all materials specified in the manner and at the time prescribed strictly in accordance with the provisions of the **Contract** including, but not limited to, the specifications and/or drawings together with all **Addenda** issued by the Awarding Authority and received by the Bidder, prior to the scheduled **Date and Time of the Bid Opening** as stated on **page 1** of the **Invitation To Bid**, and in conformity with requirements of the Awarding Authority and any laws or Departmental regulations of the State of Connecticut or of the United States which may affect the same, for and in consideration of the price(s) stated on this **Bid Proposal Form**, hereof.

**1.3.3** The Bidder acknowledges that the **Proposed Lump Sum Base Bid** submitted on this **Bid Proposal Form** includes all work indicated on the drawings and/or described in the specifications, **except** for the **Contingent Work** described in **Subsection 2.4**.

**1.3.4** The Bidder acknowledges and agrees to furnish all labor and materials required for this **Project**, in accordance with the accompanying **Plans and Specifications** prepared by the **Architect/Engineer** listed on **page 1** of this Bid Proposal Form, for the **Contract Sum** specified in the **Proposed Lump Sum Base Bid** in **Subsection 2.1** of this Bid Proposal Form, subject to **additions** and **deductions** according to the terms of the specifications, and including the number of **Addenda** stated in **Subsection 2.2** of this Bid Proposal Form.

**1.4 Award:**

**1.4.1** All Bid Proposals shall be subject to the provisions of **Section 00 21 13 Instructions to Bidders** and for purpose of award, consideration shall be given only to Bid Proposals submitted by qualified and responsible Bidders.

**1.4.2** The award shall be made on the **lowest Lump Sum Bid** and any or all **Supplemental Bid(s)** as stated in **Subsection 2.4.2** of this **Bid Proposal Form**, taken sequentially, as applicable, provided funds are available.

**1.4.4** In the event of any **discrepancy** between the amount written in words and the amount written in numerical figures, the amount written in words shall be controlling.

**2.0 Bid Proposal Requirements:**

**Bidder Information:**

**Bid Uploaded On:**     
 (Month) (Day) (Year)

**Proposal Of:**   
 (Complete Bidder's Legal Company Name As Registered With the CT Secretary of State)

**Firm Address:**  ,  ,    
 (Avenue / Street) (Town / City) (State) (Zip Code)

**Contact Person:**    
 (Name) (Title)

**Contact Information:**     
 (Phone Number) (Fax Number) (Email Address)

**Threshold Project: Major Contractor Registration License No.:**

**All Bidders for Projects that exceed Threshold Limits (see page 1 of this Bid Proposal Form):** Insert your Firm's **Major Contractor Registration License Number** in the space provided above. **NOTE:** If this Project does **NOT** exceed Threshold Limits, insert **"Not Applicable"** in the blue box above. Delete this note by **pressing the spacebar**.

**2.1 Proposed Lump Sum Base Bid:**

**2.1.1 All Bidders:** Insert the **Proposed Lump Sum Base Bid** in the spaces provided below, including **both numerical figures** and **"printed words" dollar amount**. The **Proposed Lump Sum Base Bid** shall *include* all **Allowances**, all work indicated on the drawings and/or described in the specifications **except for Contingent Work**.

**2.1.2** The **Proposed Lump Sum Base Bid** shall be shown in **both numerical figures** and **"printed words" dollar amount**. In the event of any discrepancy the **"printed" words dollar amount** shall govern.

**2.1.3** The **Proposed Lump Sum Base Bid** is:

\$   
 (Place Numerical Figures in the Box Above)

**Dollars**  
 (Insert "Printed Words" Dollar Amount in the Box Above)

**2.2 Number of Addenda:**

**2.2.1 All Bidders:** Insert the **Number of Addenda** issued by the State of Connecticut in the space provided below.

**2.2.2** Failure to acknowledge the **correct number** of all **Addenda** in **the box below** in this **Bid Proposal Form** **shall** cause **rejection** of the bid.

**2.2.3** The Bidder acknowledges that their **Proposed Lump Sum Base Bid Proposal** **includes:**

**Number of Addenda. If none, enter "0".**

**2.3 Allowances:**

See Section 01 20 00 Contract Considerations in Division 01 General Requirements for Allowances for applicability.

**2.4 Contingent Work:**

**2.4.1 Unit Prices:**

See Section 01 20 00 Contract Considerations in Division 01 General Requirements for Unit Prices for Earth and Rock Excavation, Environmental Remediation, and Hazardous Building Materials Abatement for applicability.

**2.4.2 Supplemental Bids:**

.1 See **Section 01 23 13 Supplemental Bids** in Division 01 General Requirements for applicability.

.2 **All Bidders: If Supplemental Bids are applicable** to this Project, insert the **Supplemental Bids** in the spaces provided below. Any **Supplemental Bids** listed below, *if* accepted by the Owner, will be taken cumulatively and in numerical order as scheduled. No Supplemental Bid will be skipped or taken out of numerical order as scheduled.

**Supplemental Bid No. 1: Enter information in blue boxes below:**

ADD: \$	<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>	Dollars
	<i>(Insert Numerical Figures)</i>	<i>(Insert "Printed Words" Dollar Amount)</i>	

**Supplemental Bid No. 2: Enter information in blue boxes below:**

ADD: \$	<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>	Dollars
	<i>(Insert Numerical Figures)</i>	<i>(Insert "Printed Words" Dollar Amount)</i>	

**Supplemental Bid No. 3: NOT APPLICABLE**

ADD: \$	<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>	Dollars
	<i>(Insert Numerical Figures)</i>	<i>(Insert "Printed Words" Dollar Amount)</i>	

**Supplemental Bid No. 4: NOT APPLICABLE**

ADD: \$	<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>	Dollars
	<i>(Insert Numerical Figures)</i>	<i>(Insert "Printed Words" Dollar Amount)</i>	

**2.5 Bidder's Qualification Statement and Objective Criteria for Evaluating Bidders:**

2.5.1 **All Bidders:** Download **Section 00 45 14 General Contractor Bidder's Qualification Statement** from BizNet for a template and instructions. Complete and upload **Section 00 45 14 General Contractor Bidder's Qualification Statement** to Biznet *prior* to the date and time of the Bid Opening. Information with regards to the **General Contractor's Bidder's Qualification Statement** is submitted and is made part of this **Bid Proposal Form**. Failure of a Bidder to answer any question or provide required information *shall* be grounds for the awarding authority to **disqualify** and **reject** the bid, pursuant to Connecticut General Statutes §4b-92.

2.5.2 **All Bidders** shall comply with **Section 00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders**. **Note:** Individual Specification Sections may contain General Contractor and/or Subcontractor Qualification requirements that exceed those in **Section 00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders**.

**2.6 Bidder's Prequalification Requirements for Projects Exceeding \$500,000:**

**All Bidders for Projects with estimated Construction Costs greater than \$500,000:** Upload to BizNet a current copy of your Firm's "**DAS Contractor Prequalification Certificate**" and "**Update (Bid) Statement**" for the applicable **Class of Work** on **page 1** of this **Bid Proposal Form** *prior* to the date and time of the Bid Opening. Failure to comply with this requirement **shall** cause rejection of the bid and shall not be considered a minor irregularity under **C.G.S. § 4b-95**. See **Section 00 40 15 CT DAS Prequalification Forms** for instructions on preparing and/or downloading your Firm's "**DAS Contractor Prequalification Certificate**" and "**DAS Update (Bid) Statement**".

**2.7 Named Subcontractors and Classes of Work:**

**2.7.1 All Bidders for Projects with one or more Classes of Work checked in Table 2.7 below:** Complete Table 2.7 according to the instructions below. Failure to properly provide all of the **required information** in Table 2.7 may cause rejection of the bid.

Table 2.7: Named Subcontractors and Classes of Work:	
<input type="checkbox"/>	<b>Electrical Work: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____
<input type="checkbox"/>	<b>HVAC Work: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____
<input type="checkbox"/>	<b>Masonry Work: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____
<input type="checkbox"/>	<b>Plumbing Work: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____
<input type="checkbox"/>	<b>Environmental Remediation: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____
<input type="checkbox"/>	<b>Hazardous Materials Abatement: NOT APPLICABLE</b> Complete Subcontractor Name: _____ Proposed Dollar Value of Subcontract: \$ _____

- 2.7.2 Instructions For Table 2.7:**
- .1 Each **Class of Work** set forth in a separate section of the specifications pursuant to this Section shall be a **subtrade** designated in **Table 2.7** of this **Bid Proposal Form** and shall be the matter of a **subcontract**.
  - .2 When a box is checked in **Table 2.7**, the Bidder shall insert the name of the Subcontractor with the **largest** proposed Subcontract Value; this is known as the **“Named Subcontractor”**. The Bidder shall provide all of the information for each **checked Class of Work**.
  - .3 If a **Bidder** intends to use a **Subcontractor** to perform **any portion** of the Named **Classes of Work**, including circumstances where the Subcontractor is a Small Business Enterprise (SBE) or a Minority Business Enterprise (MBE), then it must list the Subcontractor or SBE/MBE Subcontractor as the case may be, for such Class of Work. A **Bidder** may **not** substitute itself for any of the Named Classes of Work. The Bidder **should not list itself** as the **Named Subcontractor** if it intends to use a **Subcontractor** to perform any portion of the Classes of Work listed in **Table 2.7**. The Bidder should name the Subcontractor.
  - .4 For each **Class of Work** specified in **Table 2.7**, the Bidder shall list the **Subcontractor** with the **largest Proposed Dollar Value of Subcontract** for each Class of Work as the **Named Subcontractor** and the **Proposed Dollar Value** of its Subcontract. If the Bidder intends to use **more than one** Subcontractor to perform a Class of Work, then it shall indicate the Subcontractor Name and Subcontract Value for the **largest** single Named Subcontractor.
  - .5 If a Bidder customarily performs any of the specified Classes of Work and is Prequalified by DAS for the Class of Work at the time of the Bid Opening Date if the work is greater than \$500,000, the Bidder may list **itself** as a Subcontractor together with its **price** in the space provided in **Table 2.7**. Failure to properly provide all of the **required information** in **Table 2.7** shall cause rejection of the bid.
  - .6 If the Bidder does **not** name **itself** or a **Subcontractor** for a specified Class of Work, it shall be presumed that the Bidder intends to perform with its own employees **all work** in such specified classes. The Bidder shall be required to perform with its own employees **all** of the work of the specified class. Subcontracting any portion of such specified class of work subsequently, will be considered a violation of **C.G.S. § 4b-95** and subject the Bidder to disqualification under **C.G.S. § 4b-95(e)**.
  - .7 In the event the Bidder either lists itself or is presumed to perform with its own employees all work in a specified class, no such sub-bid by a Bidder shall be considered unless the Bidder can show to the satisfaction of the awarding authority, based on objective criteria established for such purpose, that it customarily performs such subtrade work and is qualified to do the character of work required by the applicable section of the specifications.

**2.8 Set Aside Requirements:** (see Section 00 73 38 "CHRO Contract Compliance Regulations")

**2.8.1 All SBE/MBE Bidders:** Submit a current copy of your Firm's "DAS Set-Aside Certificate" *with* your Bid Proposal Form.

**2.8.2 All Bidders shall be required** to award not less than the percentage(s) stated on **page 1 of this Bid Proposal Form** to Subcontractors who are currently certified and eligible to participate under the State of Connecticut Set-Aside Program for **SBE and/or MBE** contractors, in accordance with C.G.S. § 4a-60g. **Failure** to meet these requirements **shall** cause rejection of the bid.

**2.9 Insurance Coverages:** The **limits of liability** for the Insurance required for this project shall be those listed in **Article 35 Contractors Insurance of Section 00 73 13 General Conditions**. Also see Section 00 62 16 Certificate of Insurance.

**2.9.1 Special Hazards Insurance:**

None is Required.

"X-C-U" Coverage (explosion, collapse, and underground damage) **shall be required** in accordance with **Article 35 Contractors Insurance of Section 00 73 13 General Conditions**.

**Asbestos Abatement Insurance** is required.

**2.9.2 Builders Risk Insurance:**

None is Required.

The Bidder **shall be required to maintain Builder's Risk Insurance** providing coverage for the entire Work at the project site, portions of the Work located away from the site but intended for use at the site, and portions of the Work in transit. Coverage shall be written on an All-Risk, Replacement Cost, and completed Value Form basis in an amount at least equal to the projected completed value of the Work and the policy shall state that the State of Connecticut shall be named as a loss payee not as an additional insured for these coverages.

**2.9.3 Commercial General Liability Insurance:**

**NOTE:** There is a new requirement regarding **commercial general liability (CGL) insurance**: All selected firms are required to provide an endorsement to the CGL insurance stating that the State of Connecticut is an additional insured. Please be advised that a blanket endorsement **may not** be acceptable.

**2.9.4 Owners and Contractors Protective Liability Insurance:**

The Bidder shall maintain **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.

**2.9.5 Umbrella Liability Insurance:**

This project requires **Umbrella Liability Insurance**. The Bidder shall provide an endorsement to the Umbrella Liability Insurance stating that the State of Connecticut is an additional insured. Select the correct **Umbrella Limit** for this **Project's Contract Value** using the "Umbrella Liability Insurance Table" below.

Umbrella Liability Insurance Table:			
Contract Value			Umbrella Limit
\$1.00	to	\$500,000.00	\$1,000,000.00
\$500,000.01	to	\$1,000,000.00	\$2,000,000.00
\$1,000,000.01	to	\$10,000,000	\$5,000,000.00
\$10,000,000.01	to	\$30,000,000	\$10,000,000.00
\$30,000,000.01	to	\$80,000,000	\$15,000,000.00
\$80,000,000.01	to	\$150,000,000	\$20,000,000.00
\$150,000,000.01	to	\$300,000,000	\$25,000,000.00



**3.0 Bid Proposal Acknowledgements:**

The Bidder *acknowledges and agrees* to the following:

**3.1 To Upload to BizNet Submit the Bid Proposal Form (all pages), All Other Bid Documents, Affidavits, and Certifications:**

**3.1.1** The Bidder acknowledges and agrees to electronically upload to DAS BizNet all pages of the **Bid Proposal Form, All Other Bid Documents, Affidavits, and Certifications**, as stated in as stated in **Section 00 21 13 Instructions to Bidders and Section 00 41 10 Bid Package Submittal Requirements**.

**3.1.2** Failure to upload any of the items marked with an asterisk (\*) in **Table 1** of **Section 00 41 10 Bid Package Submittal Requirements** *shall* cause rejection of the bid and *shall not* be considered a minor irregularity under **C.G.S. § 4b-95**.

**3.1.3** If there are any delays in the receipt of other documents then the Bid shall remain valid for the same additional number of days. For example, if the documents are submitted four (4) Calendar Days later; then the bid shall remain valid for ninety-four (94) Calendar Days.

**3.1.4** Failure to submit the documents before the stated deadline **may** result in rejection of the bid at the sole discretion of the Commissioner of Administrative Services.

**3.2 To Hold Bid Price:**

The Bidder acknowledges and agrees to hold the **Proposed Lump Sum Base Bid** in **Subsection 2.1** of this Bid Proposal Form for **ninety (90) Calendar Days** and any extensions caused by the Bidder's delays in required submissions. The Bidder and the State may mutually agree to extend this period. The agreement to extend the **ninety (90) Calendar Day** period may occur after the expiration of the original **ninety (90) Calendar Day** period.

**3.3 To Use and Accept Allowances:**

When applicable to this Project, the Bidder *acknowledges and agrees* to accept and use the **Allowances** as shown in **Section 01 20 00 Contract Considerations** of Division 01 General Requirements as part of the **Proposed Lump Sum Base Bid** listed in **Subsection 2.1** of this Bid Proposal Form.

**3.4 To Use and Accept the Following Contingent Work:**

**3.4.1** **Unit Prices:** When applicable to this Project, the Bidder *acknowledges and agrees* to accept and use the **Units, Add Unit Prices, and Deduct Unit Prices** as shown in **Section 01 20 00 Contract Considerations** of Division 01 General Requirements in evaluating either additions to or deductions from the Work.

**3.4.2** **Supplemental Bid:** When applicable to this Project and if accepted by the Owner, the Bidder *acknowledges and agrees* to provide all labor, material and equipment to complete the Work in accordance with the **Supplemental Bid** described in **Section 01 23 13 Supplemental Bids** of Division 01 General Requirements and provided by the Bidder in **Subsection 2.4.2** of this Bid Proposal Form.

**3.5 To Use the Named Subcontractors Listed in Table 2.7:**

The Bidder *agrees* that each of the **Named Subcontractors** stated in **Table 2.7** of this Bid Proposal Form will be used for the **Class of Work** indicated, for the **Proposed Total Subcontract Value dollar amount stated**, unless a **substitution** is permitted by the awarding authority as provided for in and in accordance with C.G.S. § 4b-96, as amended.

**3.6 To Make Good Faith Efforts to Employ MBEs:**

The Bidder acknowledges and agrees to make **good faith efforts** to employ **Minority Business Enterprises (MBEs)** as **Subcontractors** and **Suppliers** of materials under such Contract.

**3.7 To Submit a Certified Check or Bid Bond (if required):**

The Bidder acknowledges and agrees to submit a **Certified Check** or **Standard Bid Bond** *prior* to the due date and time of the Bid Opening (if required). Download **Section 00 43 16 Standard Bid Bond** from BizNet for a template and instructions.

**3.8 To Accept the Current Prevailing Wage Rate Schedule:**

The U. S. Secretary of Labor's latest decision and the State of Connecticut Department of Labor (DOL) Prevailing Wage Rate Schedule are all incorporated in the documents. The higher rate (Federal or State) for any given occupation shall prevail. At the time of bidding, the Bidder agrees to accept the current Prevailing Wage Rate Schedule, as well as the annual adjustment to the prevailing wage rate that is in effect each July 1st, as provided by DOL. See **Section 00 73 44 Prevailing Wage Rates/Contractor's Wage Certification/Payroll Certification**. Annual adjustments of prevailing wage rates will *not* be considered a matter for a contract amendment with DAS/CS.

**3.0 Bid Proposal Acknowledgements (continued):****3.9 To Comply With DEEP Requirements:**

If applicable, the Apparent Low Bidder acknowledges and agrees to **electronically register** through the Connecticut Department of Energy and Environmental Protection's (DEEP) **ezFile portal** for the *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* ("**Construction Stormwater General Permit**") within **ten (10) business days after** receipt of the "Letter of Intent" from the DAS/CS Office of Legal Affairs, Policy, and Procurement. See **Section 00 21 13 Instructions to Bidders** for more information. **IMPORTANT NOTE:** ezFile has been optimized for Google Chrome.

**3.10 To Comply With CHRO Requirements:**

If applicable, the Apparent Low Bidder acknowledges and agrees to provide the Commission on Human Rights and Opportunities with such information as is requested by the Commission concerning their **employment practices and procedures** as they relate to the current provisions of the Connecticut General Statutes governing Contract requirements within **fifteen (15) calendar days after** receipt of the "Request for the *Affirmative Action Plan and Employment Information Form Letter*" from the DAS/CS Office of Legal Affairs, Policy, and Procurement.

**3.11 To Ensure Executive Order No. 11246 for Equal Employment Opportunity & Non-Segregated Facilities Has Been Met:**

The Apparent Low Bidder acknowledges and agrees to ensure that Executive Order No. 11246 for Equal Employment Opportunity & Non-Segregated Facilities has been met for their firm and their Subcontractors. The Apparent Low Bidder also agrees to certify (if required) to the compliance of non-segregated facilities.

**3.12 To Obtain and Maintain Required Insurance Coverages:**

The Bidder acknowledges and agrees to obtain and maintain the required Insurance Coverages and submit the Firm's "**Certificate of Liability Insurance Acord® form**" within **ten (10) business days after** receipt of the "Letter of Intent" from the DAS/CS Office of Legal Affairs, Policy, and Procurement, as discussed in **Section 00 62 16 Certificate of Insurance** and **Article 35, "Contractors Insurance"** in **Section 00 73 13 General Conditions**.

**3.13 To Comply With Security Requirements for CT Department of Correction Facilities:**

When applicable to this Project, the Bidder acknowledges and agrees to comply with **Section 00 73 63 CT Department of Correction (CT DOC) Security Requirements** for Contract Forces on CT DOC Facilities.

**3.14 To Ensure C.G.S. § 12-430 for Non-Resident Contractors Has Been Met:**

If applicable, the Apparent Low Bidder acknowledges and agrees to provide either a copy of the "**Notice of Verified Status**" (Verification Letter) from the Connecticut Department of Revenue Services (DRS) (for **Verified Nonresident General/Prime Contractors**) or a copy of **Form AU-965 "Acceptance of Surety Bond"** from DRS (for **Unverified Nonresident General/Prime Contractors**) within **ten (10) business days after** receipt of the "Letter of Intent" from the DAS/CS Office of Legal Affairs, Policy, and Procurement which evidences that **C.G.S. § 12-430** for non-resident contractors has been met, as described in **Section 00 92 30 Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors**.

**3.15 To Execute Contract:**

If selected as the Prime Contractor, the Bidder acknowledges and agrees to **execute a Contract** in accordance with the terms of this **Bid Proposal Form** and the **Contract** within **fifteen (15) Calendar Days** (legal State holidays excluded) **after** notification thereof by the awarding authority. See **Section 00 52 03 Contract** for a sample.

**4.0 Confidentiality of Documents:**

- 4.1** The **undersigned** agrees that if not selected as the Prime Contractor for this project, all plans and specifications in their possession for the project shall be destroyed.
- 4.2** The **undersigned** agrees that if selected as the Prime Contractor for this project:
- 4.2.1** The **plans and specifications** shall not be disseminated to anyone except for construction of this project.
- 4.2.2** The **following provision** shall be included in all of its contracts with subcontractors and sub-consultants:
- “Any and all drawings, specifications, maps, reports, records or other documents associated with the contract shall only be utilized to the extent necessary for the performance of the work and duties under this contract. Said drawings, specifications, maps, reports, records and other documents may not be released to any other entity or person except for the sole purpose of the work described in this contract. No other disclosure shall be permitted without the prior written consent of DAS Construction Services. When any such drawings, specifications, maps, reports, records or other documents are no longer needed, they shall be destroyed.”*
- 4.2.3** Upon completion of the construction and the issuance of a certificate of occupancy, the plans and specifications shall be returned to DAS Construction Services, or destroyed, or retained in a secure location and not released to anyone without first obtaining the permission of DAS Construction Services.

**5.0 Bid Proposal Declarations:**

I (we), the undersigned, hereby declare that I am (we are) the only person(s) interested in the Bid Proposal and that it is made without any connection with any other person making any Bid Proposal for the same work. No person acting for, or employed by, the State of Connecticut is directly or indirectly interested in this Bid Proposal, or in any Contract which may be made under it, or in expected profits to arise therefrom. This Bid Proposal is made without directly or indirectly influencing or attempting to influence any other person or corporation to bid or refrain from bidding or to influence the amount of the Bid Proposal of any other person or corporation. This Bid Proposal is made in good faith without collusion or connection with any other person bidding for the same work and this proposal is made with distinct reference and relation to the plans and specifications prepared for this Contract. I (we) further declare that in regard to the conditions affecting the Work to be done and the labor and materials needed, this Bid Proposal is based solely on my (our) own investigation and research and not in reliance upon any representations of any employee, officer or agent of the State.

**6.0 Duly Authorized Signature:**

**Type of Business:** *(Check Applicable Box)*

<input type="checkbox"/> Limited Liability Corporation (LLC) <input type="checkbox"/> Partnership <input type="checkbox"/> Sole Proprietor <input type="checkbox"/> Doing Business As (d/b/a) <i>(If d/b/a box is checked provide complete name below)</i> <input style="width: 100%;" type="text"/> <i>(Doing Business As Name)</i>	<input type="checkbox"/> Corporation <i>(If Checked, Provide Corporate Seal Below)</i> <div style="border: 1px solid black; width: 150px; height: 100px; margin: 10px auto;"></div> <i>(Provide exact corporate name from corporate seal below)</i> <input style="width: 100%;" type="text"/> <i>(Name On Corporate Seal)</i>
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**Signed:**  /  /   
*(Month) (Day) (Year)*

**Bidder's Signature:**   
*(Duly Authorized) (Title)*

*(Print Named) (Date)*



## Bid Package Submittal Requirements:

**DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement**  
**450 Columbus Boulevard, Suite 1302 | Hartford, CT 06103**

<b>1.1</b>	<b>On-Line Bidding:</b>
1.1.1	All Bidders shall <b>electronically</b> upload their <b>Bid Package Documents</b> to BizNet following the <b>instructions</b> in the DAS/CS publication, <a href="#">6001 Construction On-line Bidding Instructions</a> , available for download here: Go to the DAS Homepage ( <a href="http://www.ct.gov/DAS">www.ct.gov/DAS</a> ) > Doing Business With The State > State Building Construction > Publications and Forms > DAS Construction Services Library > 6000 Series > <b>6001 Construction On Line Bidding Instructions</b> .
1.1.2	For questions, call 860-713-5783 or 860-713-5794.

<b>1.2</b>	<b>Bid Package Submittal Requirements:</b>
	All Bidders are required to <b>electronically upload Bid Package Documents</b> to BizNet <i>prior</i> to the date and time of the Bid Opening. Additional documents must be either <b>electronically uploaded</b> to BizNet <b>or</b> submitted as <b>paper copies</b> to the <b>appropriate Agency</b> . See Tables 1, 2, and 3 for specific submittal requirements.
1.2.1	<b>All Bidders:</b> See Table 1. <b>All Documents in Table 1 <u>must be electronically uploaded to BizNet.</u></b>
1.2.2	<b>Three (3) Apparent Lowest Bidders:</b> See Table 2.
1.2.3	<b>Apparent Low Bidder:</b> See Table 3.

<b>1.3</b>	<b>Deadlines for Receipt of Bid Package Documents:</b>
1.3.1	<b>Table 1:</b> Bid Package Documents must be uploaded to BizNet <i>prior</i> to the date and time of the Bid Opening. Failure to upload to BizNet any of the items <b>marked with an asterisk (*)</b> prior to the Bid Opening <b>shall</b> cause rejection of the bid and shall not be considered a minor irregularity under CGS 4b-95.
1.3.2	<b>Tables 2 and 3:</b> See the tables for additional deadlines. Failure to submit the documents before the stated deadlines <b>may</b> result in rejection of the bid at the sole discretion of the Commissioner of Administrative Services.

<b>1.4</b>	<b>Delays in Receipt of Supportive Documents from the Three Apparent Lowest Bidders:</b>		
1.4.1	If there are any delays in the receipt of the supportive documents specified in Tables 2 and 3, then the Bids shall remain valid for the same additional number of days. <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px;">.1</td> <td>For example, since the <b>Three (3) Apparent Lowest Bidders</b> are required to <b>Hold The Bid Price</b> for <b>ninety (90) calendar days</b>, if supportive documents are submitted <b>four (4) calendar days</b> later, then the bid shall remain valid for <b>ninety-four (94) calendar days</b>.</td> </tr> </table>	.1	For example, since the <b>Three (3) Apparent Lowest Bidders</b> are required to <b>Hold The Bid Price</b> for <b>ninety (90) calendar days</b> , if supportive documents are submitted <b>four (4) calendar days</b> later, then the bid shall remain valid for <b>ninety-four (94) calendar days</b> .
.1	For example, since the <b>Three (3) Apparent Lowest Bidders</b> are required to <b>Hold The Bid Price</b> for <b>ninety (90) calendar days</b> , if supportive documents are submitted <b>four (4) calendar days</b> later, then the bid shall remain valid for <b>ninety-four (94) calendar days</b> .		
1.4.2	Failure to submit the documents before the stated deadline <b>may</b> result in rejection of the bid at the sole discretion of the Commissioner of Administrative Services.		

TABLE 1 – ALL BIDDERS			
Construction Costs:		The Bid Proposal Form, Other Bid Package Documents, Affidavits, and Certifications <u>shall</u> be electronically uploaded to BizNet by <u>all</u> Bidders prior to the Date and Time of the Bid Opening.	Form Location
Less Than \$500,000	Greater Than \$500,000		
Bid Proposal Form and Other Bid Package Documents			
p	p	* Section 00 41 00 Bid Proposal Form	BizNet
p	p	* Section 00 43 16 Standard Bid Bond or Certified Check	BizNet
	p	* DAS Prequalification Certificate	BizNet
	p	* DAS Update (Bid) Statement	BizNet
p	p	* Section 00 45 14 General Contractor Bidder’s Qualification Statement	BizNet
p	p	Section 00 40 14 Certificate (of authority)	BizNet
p		DAS Set-Aside Certificate	BizNet
p	p	SP-26 (Electronic Signature Page)	BizNet
Affidavits and Certifications			
p	p	* Gift and Campaign Contribution Certification – OPM Ethics Form 1	BizNet
p	p	* Consulting Agreement Affidavit – OPM Ethics Form 5	BizNet
p	p	* Ethics Affidavit (Regarding State Ethics) – OPM Ethics Form 6	BizNet
p	p	Iran Certification – OPM Ethics Form 7	BizNet
p	p	Nondiscrimination Certification – Form A, B, C, D, or E	BizNet

**\* NOTE:** Failure to electronically upload any of the items marked above with an asterisk (\*) prior to the date and time of the Bid Opening shall cause rejection of the bid and shall not be considered a minor irregularity under CGS 4b-95.

TABLE 2 – THREE (3) APPARENT LOWEST BIDDERS			
Construction Costs:		WHEN APPLICABLE:	Form Location
Less Than \$500,000	Greater Than \$500,000		
	p	Submit within <b>ten (10) Calendar Days</b> <i>after</i> receipt of the “ <b>Set-Aside Contractor Schedule Request</b> ” from the DAS/CS Procurement Unit:	Email From DAS/CS Procurement Unit
	p	<b>Set-Aside Contractor Schedule</b> for each subcontracted SBE and/or MBE firm(s) (See Section 00 73 27 Set-Aside Contractor Schedule for a sample Request.)	Email From DAS/CS Procurement Unit
	p	<b>DAS Set-Aside Certificate(s)</b> for each subcontracted SBE and/or MBE firm(s) listed in the Set-Aside Contractor Schedule.	Download from BizNet
	p	<b>Section 00 45 17 Named Subcontractor Bidder’s Qualification Statements</b> for each Named Subcontractor listed in the Bid Proposal Form.	Copy from Project Manual
	p	<b>DAS Prequalification Certificate(s) and Update (Bid) Statement(s)</b> for each Named Subcontractor listed in the Bid Proposal Form <b>with Subcontracts greater than \$500,000.</b>	Download from BizNet

TABLE 3 – APPARENT LOW BIDDER			
Construction Costs:		When Applicable, submit the following documents as noted:	Form Location
Less Than \$500,000	Greater Than \$500,000		

For Projects <b>greater than Five Hundred Thousand Dollars (\$500,000) and/or</b> For Firms with <b>fifty (50)</b> or more employees: Submit within <b>fifteen (15) calendar days</b> <i>after</i> receipt of the “ <b>Request for the Affirmative Action Plan and Employment Information Form Letter</b> ” from the DAS/CS Procurement Unit:			
p	p	<b>Submit to CT CHRO:</b> Affirmative Action Plan and Employment Information Form (DAS-45) (see forms in BizNet).	BizNet
p	p	<b>Submit to DAS/CS Procurement Unit:</b> Copy of Affirmative Action Plan Transmittal Letter.	(copy of item above)
p	p	<b>Submit to CT Department of Labor:</b> Contractors Wage Certification Form. See Section 00 73 44 Prevailing Wage Rates/Contractor’s Wage Certification/Payroll Certification.	Copy from Project Manual

For projects involving <b>one (1) acre or more of soil disturbance:</b> Complete the <i>General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities</i> within <b>ten (10) business days</b> <i>after</i> receipt of the “ <b>Letter of Intent</b> ” from the DAS/CS Procurement Unit:			
p	p	<b>Electronically register</b> the <i>General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities</i> (“Construction Stormwater General Permit”) through the CT Department of Energy and Environmental Protection’s (DEEP) <b>ezFile Portal</b> .	DEEP ezFile Portal
p	p	<b>Submit to DAS/CS Procurement Unit:</b> A <b>copy</b> of the DEEP confirmation email (stating that the Registration was successfully submitted electronically).	Submit to DAS/CS Procurement Unit
p	p	<b>Notify the DAS/CS Project Manager</b> when the DEEP sends a confirmation email (stating that the Registration was successfully submitted) in order for the Owner to know when to transfer the funds to DEEP. The Owner shall be responsible for the cost of the General Permit Fee.	Submit To DAS/CS Project Manager

<b>TABLE 3 – APPARENT LOW BIDDER (continued)</b>			
<b>Construction Costs:</b>		Submit within <b>ten (10) business days</b> <i>after</i> receipt of the “ <b>Letter of Intent</b> ” from the DAS/CS Procurement Unit:	Form Location
Less Than \$500,000	Greater Than \$500,000		
p	p	<b>Section 00 40 14 Certificate (of authority)</b>	Email From DAS/CS Procurement Unit
p	p	<b>Section 00 52 03 Contract</b>	Email From DAS/CS Procurement Unit
	p	<b>Section 00 52 73 Subcontract Agreement Form (Named &amp; Listed)</b>	Email From DAS/CS Procurement Unit
p	p	<b>Certificate of Liability Insurance Acord® form</b> (See Section 00 62 16 Insurance Certificate Form for details)	Email From DAS/CS Procurement Unit
p	p	<b>Certificate of Asbestos Abatement Liability Insurance</b> (for asbestos abatement only) (See Section 00 62 16.1 Asbestos Abatement Liability Insurance for details)	Email From DAS/CS Procurement Unit
p	p	<b>Section 00 92 10: Additional Forms</b>	<b>Performance Bond</b>
p	p		<b>Labor &amp; Material Bond</b>
p	p		<b>Surety Sheet</b>
p	p		<b>Bidder’s Certification: Financial Position &amp; Corporate Structure</b>
p	p	<b>Power of Attorney from the Surety Company</b>	Surety Company
p	p	<b>Nonresident (Out of State) Contractors:</b> <u>Verified Nonresident</u> General/Prime Contractors must submit a copy of their “ <b>Notice of Verified Status</b> ” (Verification Letter) from the CT Department of Revenue Services (DRS). <u>Unverified Nonresident</u> General/Prime Contractors must submit a copy of <b>Form AU-965 “Acceptance of Surety Bond”</b> from the DRS. (See Section 00 92 30 Procedures Regarding Taxation for Nonresident General/Prime Contractor and Subcontractors for additional details.)	<b>CT Department of Revenue Services</b>
	p	<b>Ethics Affidavit (Regarding State Ethics) OPM Ethics Form 6</b> for each Named Subcontractor	<b>BizNet</b>
p	p	<b>Threshold Projects Only:</b> Submit <b>Major Contractor Registration License Number(s)</b> for Subcontractors	<b>CT Department of Consumer Protection</b>
p	p	<b>SEEC Form 10</b>	<b>SEEC Website</b>
p	p	<b>Certificate of Legal Existence from Corporations</b>	<b>Secretary of the State</b>

End of Section  
 00 41 10 Bid Package Submittal Requirements



**INSTRUCTIONS FOR CERTIFIED CHECK OR BID BOND (select one):**  
**All Bidders:**  
**Edit this page, print, sign, and scan to PDF. Upload the PDF form to BizNet.**

- CERTIFIED CHECK OPTION:** *Prior* to the Date and Time of the Bid Opening:
  - (1) Check the box for "Certified Check Option";
  - (2) Print, scan to PDF, and upload the PDF form to Biznet; and
  - (3) Deliver the Certified Check, made payable to "Treasurer, State of Connecticut", to the following address:  
 State of Connecticut  
 Department of Administrative Services, Construction Services  
 Office of Legal Affairs, Policy, and Procurement  
 450 Columbus Boulevard, North Tower, Suite 1302  
 Hartford, CT 06103-1835
- BID BOND OPTION** (see template below): *Prior* to the Date and Time of the Bid Opening:
  - (1) Check the box for "Bid Bond Option";
  - (2) Complete the **Standard Bid Bond** (below), print, sign, scan to PDF, and upload the PDF Bid Bond to Biznet.

**Standard Bid Bond**

**DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement**

KNOW ALL MEN BY THESE PRESENTS, That we, \_\_\_\_\_

\_\_\_\_\_, hereinafter called the Principal,

of \_\_\_\_\_, as Principal,

and \_\_\_\_\_, hereinafter

called the Surety, a corporation organized and existing under the laws of the

State of \_\_\_\_\_, and duly authorized to transact a

surety business in the State of Connecticut, as Surety, are held and firmly bound unto the State of

Connecticut, as Obligee, in the penal sum of ten (10) percent of the amount of the bid set forth in a

proposal hereinafter mentioned, \_\_\_\_\_

\_\_\_\_\_,

lawful money of the United States of America, for the payment of which, well and truly to be made to the Obligee,

the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns,

jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, That, whereas the Principal has submitted

or is about to submit a proposal to the Obligee related to a contract for Project No.: \_\_\_\_\_

NOW, THEREFORE, if the said contract be awarded to the Principal and the Principal shall, within such time as

may be specified, enter into the said contract in writing with the State of Connecticut and give the required

bonds, with surety acceptable to the Obligee, or if the Principal shall fail to do so, pay to the Obligee the

damages which the Obligee may suffer by reason of such failure not exceeding the penalty of this bond, then

this obligation shall be void, otherwise to remain in full force and effect.

SIGNED, SEALED AND DELIVERED this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_

\_\_\_\_\_  
(Principal's Signature)

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Surety

by \_\_\_\_\_  
Its attorney in fact Signature

\_\_\_\_\_  
(Print Name)



## General Contractor Bidder's Qualification Statement

DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement

**Instructions:**

- All Bidders are **required** to **upload this form to BizNet**, properly completed, **prior to the date and time of the Bid Opening**.
- Failure of a Bidder to answer any question or provide required information **shall** be grounds for the awarding authority to disqualify and reject the bid, pursuant to Connecticut General Statutes §4b-92.
- If a question or request for information does not pertain to your organization in any way, use the symbol "NA" (Not Applicable).
- Attach additional information on 8 ½" x 11" sheets with your letterhead as necessary and reference specific section and subsection numbers.
- **NOTE:** The Department reserves the right to request any additional or supplemental information necessary to complete its evaluation of a Bidder's qualification.

**1.0 Project Information:**

1.1 DAS/CS Project Number:

1.2 Project Name:

1.3 Project Location:

**2.0 Projects with Construction Costs Estimated To Be Greater than \$500,000:**

- Select the applicable **Class of Work** as stated in the **00 11 16 Invitation to Bid**.
- Select **YES** if your Firm has the applicable the **DAS Prequalification Certificate and Update (Bid) Statement** or **NO** if it does not.
- If **YES**, upload the applicable **DAS Prequalification Certificate and Update (Bid) Statement** to BizNet **prior** to the date and time of the Bid Opening.

**Not Applicable - Construction Costs Less than \$500,000**

	Class of Work:	Does your Firm have the applicable DAS Prequalification Certificate and Update (Bid) Statement?
2.1	<input type="checkbox"/> General Building Construction (Group A):	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.2	<input type="checkbox"/> General Building Construction (Group B):	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.3	<input type="checkbox"/> General Building Construction (Group C):	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.4	<input type="checkbox"/> General Trades (Interior Work Only):	YES <input type="checkbox"/> NO <input type="checkbox"/>
2.5	<input type="checkbox"/> CPS Projects ONLY: Insert Class of Work	YES <input type="checkbox"/> NO <input type="checkbox"/>

**3.0 Firm's Present Legal Name:** (the *complete legal name exactly* as it appears with the **Secretary of State registry**. The appropriate **title** must be used throughout the documents, for example: General Partner, Member, Manager, Sole Member, etc.)

**Name:**

**4.0** How many years has your Firm been in business under its **Present Legal Name**?

**Years:**

**5.0** How many years has your Firm been in business as a General Contractor?

**Years:**

**6.0** Indicate **all** other **names** by which your Firm has been known and the **length of time** known by each name:

**6.1**

Years	Months

**6.2**

Years	Months

**6.3**

Years	Months

**7.0** This Firm's **Certification** with the CT Secretary of State:

**Check Box**

**Type of Business Entity:**

**Certification Year**

**Corporation**



**Partnership**



**Sole Proprietorship**



**Limited Liability Company (LLC)**



**Other:**



**8.0** Attach resumes of all **supervisory personnel**, such as **Principals, Project Managers, and Superintendents**, who will be directly involved with the project on which you are now a bidder. Indicate their construction related training, certifications and licenses and the number of years of actual construction experience. Indicate the number of years of this actual construction experience which were in a Supervisory capacity.

**9.0 Named Subcontractor – Bidder Intends to Self-Perform:**

Check **YES** or **NO** for each “Named Subcontractor” **Class of Work** which your firm intends to perform with its own employees for this Contract; see **Section 2.7** of **Section 00 41 00 Bid Proposal Form**.

**NOTE:** For Projects with Construction Costs estimated to be greater than \$500,000, complete **Section 00 45 17 Named Subcontractor Bidder's Qualification Statement** for each **Named Subcontractor Class of Work** checked **YES** and submit within ten (10) calendar days *after* receipt of the “Set-Aside Contractor Schedule Request” from DAS/CS Office of Legal Affairs, Policy, and Procurement.

<input type="checkbox"/>	<b>Not Applicable – No Named Subcontractors &amp;/or Not Self-Performing</b>	
	Named Subcontractor Class of Work	Does your Firm intend to self-perform this Named Subcontractor Class of Work?
9.1	Electrical:	YES <input type="checkbox"/> NO <input type="checkbox"/>
9.2	HVAC:	YES <input type="checkbox"/> NO <input type="checkbox"/>
9.3	Masonry:	YES <input type="checkbox"/> NO <input type="checkbox"/>
9.4	Plumbing:	YES <input type="checkbox"/> NO <input type="checkbox"/>
9.5	Environmental Remediation:	YES <input type="checkbox"/> NO <input type="checkbox"/>
9.6	Hazardous Materials Abatement:	YES <input type="checkbox"/> NO <input type="checkbox"/>

**10.0 Named Subcontractor - Class of Work Greater than \$500,000 and Self-Performing:**

- Select the applicable **Named Subcontractor Class of Work** which your firm intends to perform with its own employees for this Contract.
- Select **YES** if your Firm has the applicable the **DAS Prequalification Certificate and Update (Bid) Statement** or **NO** if it does not.
- If **YES**, submit the applicable **DAS Prequalification Certificate and Update (Bid) Statement** within ten (10) calendar days *after* receipt of the “Set-Aside Contractor Schedule Request” from DAS/CS Office of Legal Affairs, Policy, and Procurement.

<input type="checkbox"/>	<b>Not Applicable – No Class of Work Greater \$500,000 &amp;/or Not Self-Performing</b>	
	Named Subcontractor Class of Work Greater Than \$500,000	Does your Firm have the applicable DAS Prequalification Certificate and Update (Bid) Statement?
10.1	<input type="checkbox"/> Electrical:	YES <input type="checkbox"/> NO <input type="checkbox"/>
10.2	<input type="checkbox"/> HVAC:	YES <input type="checkbox"/> NO <input type="checkbox"/>
10.3	<input type="checkbox"/> Masonry:	YES <input type="checkbox"/> NO <input type="checkbox"/>
10.4	<input type="checkbox"/> Plumbing:	YES <input type="checkbox"/> NO <input type="checkbox"/>

**11.0 List all** construction projects your Firm has completed in the **past five (5) years**. Provide **all** of the information listed below. DAS/CS *may* reject a bid as **non-responsive** if the bidder does not make **all** required pre-award submittals within the designated time period. Attach additional sheets as necessary **using the following format**:

**IMPORTANT NOTE:** **Two (2)** of the construction projects completed in the past five (5) years shall be (1) single project contracts that have reached substantial completion, not aggregate projects; (2) of commercial and/or institutional construction work (this includes compliance with general requirements); (3) within the Cost Estimate Range stated in Section 00 11 16 Invitation to Bid for this project; and (4) of the size and complexity of this Project. Failure to identify to **two** such projects **shall** result in rejection of the bid.

<b>11.1 Project Title:</b>		
<b>11.2 Project Location:</b>		
<b>11.3 Construction Start Date:</b>		
<b>11.4 Construction Finish Date:</b>		
<b>11.5 Describe the Scope of Work your Firm performed:</b>		
<b>11.6 Original Contract Amount:</b>		
<b>11.7 Final Contract Amount:</b>		
<b>11.8 Original Contract Duration (Calendar Days):</b>		
<b>11.9 Final Contract Duration (Calendar Days):</b>		
<b>11.10 Owner:</b>		
<b>11.11 Owner's Representative:</b>		
	<i>(Name)</i>	<i>(Phone Number)</i>
<b>11.12 Design Firm:</b>		
<b>11.13 Design Firm's Representative:</b>		
	<i>(Name)</i>	<i>(Phone Number)</i>

**12.0 References:**

Furnish references from **architects, engineers or owners** indicating that your Firm has satisfactorily completed in a timely manner contract work for projects within the cost estimate range, size and complexity of this project. Provide explanations where delays have occurred. This information should cover work done over the past five years.

**13.0 Construction Scheduler:**

**For Projects greater than \$5 Million:** Submit the **name, resume and references** of the **Construction Scheduler** in accordance with the requirements called for in Section **01 32 16.13 Critical Path Method Schedules** of the General Requirements.

Not Applicable – Project Less Than \$5 Million

**14.0** List and explain if your Firm has ever failed to complete a contract or if any officer or partner of your Firm has ever been an officer or partner of another organization that failed to complete a contract. Indicate below the circumstances leading to the project failure and the name of the company which provided the bonding for the failed contract(s):

Not Applicable

**15.0** List and explain if your Firm has ever had a contract terminated, indicating the circumstances leading to the project termination of contract(s):

Not Applicable

**16.0** List and explain all legal or administrative proceedings against your Firm or any officers, principals, partners, members, or employees of the organization currently pending or concluded adversely within the last five years, and any judicial or administrative sanctions that are still in effect against such organization, and any of its officers, principals, partners, members, or employees. (Exclude Occupational Safety and Health Act [OSHA] violations which are called for elsewhere in this statement). Add attachments as necessary.

Not Applicable

**17.0** List and explain any disbarments or suspensions that have been imposed on your Firm in the past five years or that were still in effect during the five year period or that are still in effect. Such list must include disbarments and suspensions of officers, principals, partners, members, and employees of your Firm:

Not Applicable

**18.0** List and explain any other reason(s) that precludes your Firm or any officer, principal, partner, member, or employees thereof from bidding on a contract in Connecticut or any other jurisdiction:

Not Applicable

**19.0** List and explain all willful or serious violations your Firm has had of any 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. Add attachments as necessary.

Not Applicable

**20.0** List and explain any criminal convictions your Firm has had related to the injury or death of any employee in the three-year period preceding the bid: Add attachments as necessary.

Not Applicable

**21.0** List and explain any changes in your Firm's financial condition or business organization, which might affect your Firm's ability to successfully complete this contract:

Not Applicable

**22.0** **NEW:** List and explain if your Firm has ever failed to submit an Affirmative Action Plan to the Commission on Human Rights and Opportunities (CHRO). Indicate below the circumstances leading to the failure to submit the Affirmative Action Plan to CHRO:

Not Applicable

**23.0** **NEW:** List and explain if your Firm's Affirmative Action Plan has ever been disapproved by CHRO or determined to be noncompliant. Indicate below the circumstances leading to the disapproval or finding of noncompliance of your Affirmative Action Plan by CHRO:

Not Applicable



## 24. Signature

Dated at

Signed this

 day of , 20 

Name of Firm:

Firm Address:

Signature:

Print or Type Name:

Title:

## 25. 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 , 20

Notary Public

My Commission Expires , 20

End of Section

00 45 14 General Contractor Bidder's Qualification Statement



## Objective Criteria Established for Evaluating Qualifications of Bidders:

CT DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement

The following items are established pursuant to Sections 4b-92, 4b-94 and 4b-95a of the Connecticut General Statutes (C.G.S.) as amended.

The **Objective Criteria Established for Evaluating Qualifications of Bidders** (Section 00 45 15) are to assure that the State of Connecticut will secure the "lowest responsible and qualified bidder" who has the ability and capacity to successfully complete the Bid Proposal Form and the Work. Failure to comply with any portion of this requirement **may** cause **rejection** of the bid. **Note:** Individual Specification Sections **may** contain General Contractor and/or Subcontractor Qualification requirements that **exceed** those in **Section 00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders**.

**THE BIDDER MUST HAVE OR HAVE COMPLETED THE FOLLOWING:**

### 1.1 DAS Prequalification Requirements:

For Projects with Construction Costs greater than \$500,000, **all Bidders** shall upload to BizNet a valid Department of Administrative Services (DAS) **Prequalification Certificate** and **Update (Bid) Statement** *prior* to the date and time of the Bid Opening.

### 1.2 Evaluation:

**1.2.1 All Bidders** shall upload to BizNet **Section 00 45 14 General Contractor's Bidder Qualifications Statement** *prior* to the date and time of the Bid Opening.

**1.2.2** If applicable, the **Three (3) Lowest Bidders** shall submit **Section 00 45 17 Named Subcontractor's Bidder Qualification Statement(s)** to DAS Construction Services (DAS/CS) Office of Legal Affairs, Policy, and Procurement within **ten (10)** calendar days **after** receipt of the "Set-Aside Contractor Schedule Request" *from* DAS/CS.

**1.2.3** The Bidder must demonstrate that the Bidder and, if applicable, its Named Subcontractors, meet the **objective criteria** for this specific project.

**1.2.4** The **responses** to the Statement(s) must identify two (2) **projects completed** – single project contracts that have reached substantial completion, not aggregate projects – of commercial and/or institutional construction work (this includes compliance with general requirements) during the past five (5) years within the Cost Estimate Range stated in Section 00 11 16 **Invitation to Bid** for this project, and of the size and complexity of this project. The failure to identify to such projects shall result in rejection of the bid.

**1.2.5** If the Bidder identifies two projects that meet the above criteria, the **State's evaluation** shall be based on the **performance record** of the prospective Bidder as a general, prime contractor and its named subcontractors during the course of the two (2) comparable projects, and not just the end result. The state will conduct the evaluation based on its interpretation of its objective criteria. **Evaluation criteria** shall include: Faithful and efficient performance; fulfilment of contract obligations; financial, managerial and technical abilities; and integrity and the absence of any conflicts of interest. Any one or all of the factors noted in this paragraph as well as in the other criteria set forth in this **Section 00 45 15** may be grounds for the determination by the State, in its sole discretion, of the Bidder's responsibility and qualifications necessary for the faithful performance of the work required of this project.

### 1.3 References:

Furnished **references from architects, engineers or owners** indicating that it has satisfactorily completed in a timely manner contract work for projects and provide explanations where delays have occurred. This information should cover work done over the **past five years**. Review of DAS/CS projects shall be included in the evaluation of the bidder's qualifications and anticipated future performance.

<b>1.4</b>	<b>Qualified Personnel:</b>
1.4.1	Shown that it customarily employs or has on its payroll <b>supervisory personnel, qualified</b> to perform the work required for this project and to coordinate the work called for in the Bid Specifications.
1.4.2	If the project is for \$5 Million or more, submit the <b>name, resume and references</b> of the <b>Construction Scheduler</b> in accordance with the requirements called for in <b>Section 01 32 16.13 Critical Path Method Schedules</b> of the General Requirements.
<b>1.5</b>	<b>Past Performance:</b>
	Demonstrated a good track record of <b>past performance</b> on State or other projects relative to quantity, quality, timeliness, cost, cooperation and harmonious working relationships with subcontractors, suppliers and client agencies. DAS/CS will review the Bidders past performance ratings prepared by DAS/CS or prepared as part of the DAS Contractor Prequalification Program. This review may focus on the comments relative to: Quality of Supervision, Adherence to Contract Documents, On Time Project Completion, Subcontractor performance, and the handling of Change Orders. Unacceptable ratings for several criteria shall be sufficient cause to deem a bidder not responsible.
<b>1.6</b>	<b>Financial Responsibility:</b>
	Shown that it is <b>financially responsible</b> to perform the work as bid. If requested, additional financial information shall be provided. Prompt and proper payments to its subcontractors and material suppliers is a critical factor to be considered by DAS/CS.
<b>1.7</b>	[Left Blank]
<b>1.8</b>	<b>Equipment Requirements:</b>
	Shown that it owns or possesses, rented, or leased <b>equipment</b> of the type customarily required by contractors in the performance of contract work and that such equipment, if needed, is available for this project.
<b>1.9</b>	<b>Materials and Suppliers:</b>
	Purchased <b>materials</b> over the past three years from suppliers who customarily sell such materials in quantity to contractors.
<b>1.10</b>	<b>Physical Facilities:</b>
	Control of adequate <b>physical facilities</b> from which the work can be performed.
<b>1.11</b>	<b>Compliance with Subcontractor Requirements:</b>
	Demonstrated that on <b>previous state projects</b> the bidder complied in good faith with the requirements of listing subcontractors as outlined in C.G.S. Sections 4b-93 and 4b-95.
<b>1.12</b>	<b>Threshold Building and Major Contractor Requirements:</b>
	Demonstrated that <b>all major subcontractors</b> are in compliance with the provisions of C.G.S. Section 20-341gg, as revised, concerning licensure requirements to perform work on any structure that exceeds the threshold limits contained in C.G.S. Section 29-276b, as revised.
<b>1.13</b>	<b>OSHA Requirements:</b>
	Proven that the Bidder has not been found to be in violation of three or more willful or serious violations of Occupational Safety and Health Administration (OSHA) regulations in the past three years.

**1.14 Criminal Convictions and Injuries or Death of Employees:**

Not received a **criminal conviction** related to the injury or death of any employee in the three-year period preceding the bid.

**1.15 Legal or Administrative Proceedings:**

Listed all **legal** (court and/or arbitration) or **administrative proceedings** currently pending as well as any legal (court and/or arbitration) or administrative proceeding related to procurement or performance of any public or private construction contracts which has concluded adversely within the last three years.

**1.16 Contract Performance and Surety:**

Identified any situations where: (1) the bidder failed to complete a construction contract; or (2) bonds were called during the past three years. If applicable, attach a sheet providing explanation including date(s) and location(s).

**1.17 State Tax Requirements:**

Not been found to be in violation of any **state tax** requirements of the Connecticut Department of Revenue Services in the five (5)-year period preceding the bid.

**1.18 State and Federal Labor Requirements:**

Not been found to be in violation of any State or Federal **labor laws** as required through the Department of Labor including violations of prevailing wage laws in the five (5)-year period preceding the bid.

**1.19 Change Order Pricing and State Ethics:**

Been found to be in compliance with all statutory and regulatory requirements. This Item shall include, but not be limited to, any DAS/CS determinations related to improper Change Order pricing relative to C.G.S. Section 1-101nn of The State Ethics Statutes.

**1.20 Internal Revenue Services (IRS) Requirements:**

Not been found in violation of any of the **Internal Revenue Service Tax Requirements** regarding classification of employees and independent contractors in the five (5)-year period preceding the bid.

**1.21 Workers Compensation and Insurance Requirements:**

Not been found to be in any violation of C.G.S. Section 31-288 relating to employee classification for purposes of Workers' Compensation insurance premiums in the five (5)-year period preceding the bid.

**NOTE:** The foregoing Item Numbers **1.13** and **1.14** are meant to comport with C.G.S. Section 31-57b.

**End of Section**  
**00 45 15 Objective Criteria Established for Evaluating Qualifications of Bidders**



## Contract

DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement

Contract For:

Dated as of  by and between the **State of Connecticut** (herein called the  
*(Month, Day, Year)*

“State”) acting herein by its Commissioner, Department of Administrative Services under the provisions of the Connecticut General Statutes (C.G.S.) Sections 4-8, 4a-1, 4a-1a, 4a-2, 4b-1, and 4b-3, as revised, and  (herein called the “Contractor”).

*(Print Name of Contractor)*

WITNESSETH, that the State and the Contractor in consideration of the hereinafter contained mutual promises and covenants, do hereby agree as follows:

### 1. CONTRACT AND CONTRACT DOCUMENTS:

The **Invitation for Bids**, the enumerated **Plans**, the **Specifications** and **Amendments** thereto, the **Addenda**, the **Bid Proposal** as accepted by the Commissioner, Department of Administrative Services, **Order of Award**, which Order is made a part of this **Contract**, the **General Conditions**, the **General Requirements**, the **Contract** and the **Bonds** shall form part of this **Contract** and the **provisions** thereof shall be as binding upon the parties as if they were fully set forth herein. The tables of contents, titles, headings, running headlines and marginal notes contained herein and in said Documents, are solely to facilitate to various provisions of the Contract Documents and in no way affect, limit, or cast light upon the interpretations of the provisions to which they refer. Whenever the term “Contract Documents” is used, it shall mean and include this **Contract**, the **Invitation for Bids**, the enumerated **Plans**, **Specifications** and **Amendments** thereto, the **Addenda**, the **Bid Proposal** as accepted by the Commissioner, Department of Administrative Services, the **General Conditions**, the **General Requirements**, the **Bonds**, the **Notice to Bidders**, the **Wage Scales**, the **Supplementary Conditions**, and the **Insurance Certificates**.

### 2. SCOPE OF THE WORK:

The Contractor shall furnish all plant, labor, materials, supplies, equipment, and other facilities and things necessary or proper for or incidental to the work contemplated by this Contract as required by and in strict accordance with applicable Plans, Specifications and Amendments thereto, and Addenda (hereinafter enumerated), and as required by and in strict accordance with such changes as are ordered and approved pursuant to this Contract, and will perform all other obligations imposed on him by this Contract.

**3. ENUMERATION OF PLANS, SPECIFICATIONS AND ADDENDA:**

The following is an enumeration of the Plans, Specifications, and Addenda:

<b>Prepared By:</b>	<input type="text"/> <i>(Print Name of Architect/Engineer Firm)</i>
<b>Plans and Specifications:</b>	<input type="text"/>
<b>Addenda:</b>	<input type="text"/>

**4. COMPENSATION TO BE PAID THE CONTRACTOR**

The State will pay and the Contractor will accept in full consideration for the performance of the Contractor's obligation hereunder the sum of:

<input type="text"/>	Dollars and 00/100 (\$	<input type="text"/>	)
----------------------	------------------------	----------------------	---

**5. PROVISIONS REQUIRED BY LAW DEEMED INSERTED**

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

For all State contracts as defined in the **C.G.S. §9-612(f)(1)(C)**, 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 Agreement expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising state contractors of campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice. See **SEEC Form 10**.

Contractor hereby irrevocably assigns to the State of Connecticut all rights, title and interest in and to all **Claims\* associated with this Contract** that Contractor now has or may or will have and that arise under the antitrust laws of the United States, **15 USC Section 1, et seq.** and the antitrust laws of the State of Connecticut, **C.G.S. §35-24, et seq.**, including but not limited to any and all Claims for overcharges. This assignment shall become valid and effective immediately upon the accrual of a Claim without any further action or acknowledgment by the parties.

**\*Definition of Claims associated with this Contract:** "All actions, suits, claims, demands, investigations and proceedings of any kind, open, pending or threatened, whether mature, unmaturing, contingent, known or unknown, at law or in equity, in any forum."



**IN WITNESS WHEREOF**, the Commissioner, Department of Administrative Services for and on behalf of the State of Connecticut, and the Contractor have executed this contract on the day and year first written.

<b>Attested By:</b>		<b>State Of Connecticut</b>	
WITNESS: <input type="text"/>	<i>(Signature)</i>	By: <input type="text"/>	<i>(Signature)</i>
Print Name: <input type="text"/>		Print Name: <b>Melody A. Currey</b>	
WITNESS: <input type="text"/>	<i>(Signature)</i>	Its: <b>Commissioner</b>	
Print Name: <input type="text"/>		<b>Department of Administrative Services</b>	
		Date Signed: <input type="text"/>	
			<div style="border: 1px solid black; width: 100%; height: 100%; text-align: center; padding-top: 20px;"><b>SEAL</b></div>
WITNESS: <input type="text"/>	<i>(Signature)</i>	Contractor: <input type="text"/>	
Print Name: <input type="text"/>		By: <input type="text"/>	<i>(Signature)</i>
WITNESS: <input type="text"/>	<i>(Signature)</i>	Its: <input type="text"/> , <b>Duly Authorized</b>	
Print Name: <input type="text"/>		Print Name: <input type="text"/>	
		Print Title: <input type="text"/>	
Print Name: <input type="text"/>		Date Signed: <input type="text"/>	

**End of Section  
00 52 03 Contract**





## CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b>  Contractor's Legal Name and Address	<b>CONTACT</b> NAME: _____ PHONE (A.C. No. Ext): _____ FAX (A.C. No.): _____ E-MAIL ADDRESS: _____  <table style="width: 100%; border: none;"> <tr> <td style="width: 80%; border: none;">INSURER(S) AFFORDING COVERAGE</td> <td style="width: 20%; border: none;">NAIC #</td> </tr> <tr> <td style="border: none;">INSURER A:</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">INSURER B:</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">INSURER C:</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">INSURER D:</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">INSURER E:</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">INSURER F:</td> <td style="border: none;"></td> </tr> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A:		INSURER B:		INSURER C:		INSURER D:		INSURER E:		INSURER F:	
INSURER(S) AFFORDING COVERAGE	NAIC #														
INSURER A:															
INSURER B:															
INSURER C:															
INSURER D:															
INSURER E:															
INSURER F:															

**COVERAGES** **CERTIFICATE NUMBER:** \_\_\_\_\_ **REVISION NUMBER:** \_\_\_\_\_

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADD. SUBR. INSR. WORD	POLICY NUMBER	POLICY EFF. (MM/DD/YYYY)	POLICY EXP. (MM/DD/YYYY)	LIMITS
	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-WIDE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC		Policy Number must be provided	Policy Effective Date must be provided	Policy Expiration Date must be provided	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea. occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADY INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMPYOP AGG \$ 2,000,000
	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS		Policy Number must be provided	Policy Effective Date must be provided	Policy Expiration Date must be provided	COMBINED SINGLE LIMIT (Ea. accident) \$ 1,000,000 BODILY INJURY (Per person) \$ _____ BODILY INJURY (Per accident) \$ _____ PROPERTY DAMAGE (Per accident) \$ _____
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED. \$ _____ RETENTION \$ _____					EACH OCCURRENCE \$ _____ AGGREGATE \$ _____
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input type="checkbox"/> Y/N <input checked="" type="checkbox"/> N/A If yes, describe under DESCRIPTION OF OPERATIONS below		Policy Number must be provided	Policy Effective Date must be provided	Policy Expiration Date must be provided	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$ 100,000 E.L. DISEASE - EA EMPLOYEE \$ 100,000 E.L. DISEASE - POLICY LIMIT \$ 500,000
	Owner's and Contractor's Protective Liability Builder's Risk (include here when applicable)					Bodily Injury or Death (per occ.) Total \$ 1,000,000 Property Damages Total (aggregate) \$ 2,000,000 Completed Value

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES:** (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Indicate Project Number and Title here

The State of Connecticut is an Additional Insured with respect to General Liability and Umbrella/Excess Liability Insurance coverage.

If Builder's Risk and or Inland Marine/Transit Insurance is required then the State is endorsed as a Loss Payee.

<b>CERTIFICATE HOLDER</b> State of Connecticut Department of Administrative Services, Construction Services Office of Legal Affairs, Policy and Procurement 450 Columbus Boulevard, Suite 1302 Hartford, CT 06103-1838	<b>CANCELLATION</b> SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE Agent of Producer
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**End of Section**  
**00 62 16 Certificate of Insurance**



**General Conditions of the Contract for Construction  
 For Design-Bid-Build  
 Department of Construction Services  
 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 Construction Services (CT DCS) Commissioner acting directly or through specifically authorized CT DCS personnel or agent(s) having authority to perform duties defined in Article 25.

**1.21 COMMISSIONING AGENT (CxA):** An independent entity under contract directly with the Owner or Owner's Representative responsible for performing the specified commissioning procedures.

**1.22 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 Construction Services Assistant Project Manager, Department of Construction Services 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.

**1.23 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.

**1.24 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.

**1.25 CONTRACTOR OR GENERAL CONTRACTOR:** A sole proprietor, partnership, firm or Corporation, under direct Contract with the Department of Construction Services, 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.

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

**1.27 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.

**1.28 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.

**1.29 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.

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

**1.31 DEPARTMENT OF CONSTRUCTION SERVICES (CT DCS) 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.

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

**1.33 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.

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

**1.35 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.

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

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

**1.38 GUARANTEE:** See Warranty.

**1.39 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.

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

**1.41 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.

**1.42 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.

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

**1.44 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.

**1.45 OWNER OR DEPARTMENT:** The State of Connecticut, Department of Construction Services acting through its Commissioner or specifically authorized Department personnel or agent.

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

**1.47 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.

**1.48 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.

**1.49 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.

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

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

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

**1.53 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.

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

**1.55 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.

**1.56 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.

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

**1.58 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.

**1.59 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.

**1.60 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.

**1.61 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.

**1.62 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.

**1.63 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.

**1.64 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.

**1.65 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.

**1.66 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.

**1.67 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.

**1.68 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 Conditions, 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 or 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 essence 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.** Should this Contract be for a Construction Services

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 Subcontractor'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 CT DCS 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 is 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 supervision, 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 Commissioning Agent (CxA) and Construction Administrator will direct the retesting of the equipment once at no "charge" to the Contractor for their time. However, the Commissioning Agent's and Construction Administrator's time for additional testing will be charged to the Contractor.

**16.5.2** The time for the Systems Commissioning Agent 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 CT DCS Project Manager is the Commissioner's only authorized representative 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 CT DCS 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 Construction Services 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 CT DCS 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 CT DCS 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 CT DCS Form 7048 General Contractor 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.

**28.3.2.11** Pursuant to C.G.S. Sec. 4a-101, the General 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 General Contractor shall complete and submit to the State of Connecticut Department of Construction Services (CT DCS) evaluations of each such subcontractor upon fifty percent (50%) completion of the project and upon Substantial Completion of the project. The General 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 General Contractor.

**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 Construction Services, 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 Construction Services, 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 Construction Services, 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 Construction Services.

## **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:

- 38.5.1** 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, involved 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.** Verified by EPA to provide a minimum emissions reduction of 20% particulate matter (PM<sub>10</sub>), 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 CT DCS 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 CT DCS 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**

Appendix 1



7048  
General Contractor  
Retainage Reduction Request  
(SAMPLE)

To: Allen V. Herring, P.E., CT DCS Chief Engineer  
Room 265, 165 Capitol Avenue, Hartford, CT 06106

From: (Insert GC's Name), General Contractor

Subject: Project No. ( ) Reduction of Retainage at ( )% project completion

In accordance with the General Conditions, Article 28 Progress Payments, (insert GC's name) hereby requests a reduction of retainage to an amount of insert written percent Percent (insert numerical percent%). 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 General Contractor.

- DAS Contractor Performance Evaluation Score is a minimum of **Sixty (60%) Percent**.
- Timely submission of an appropriate and complete CPM 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.
- All approved credit Change Orders have been invoiced.
- All Change Order requests for pricing are current.
- The General 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.
- General Contractor is compliant with set-aside provisions of the contract.

**General Contractor Certification:** \_\_\_\_\_  
(Written Name) (Signature) (Date)

**Project Manager Recommendation:** \_\_\_\_\_  
(Written Name) (Signature) (Date)

**Approved:**  
Allen V. Herring, P.E.  
CT DCS Chief Engineer  
\_\_\_\_\_  
(Signature) (Date)







**Supplementary Conditions of the Contract for Construction  
For Design - Bid - Build  
Department of Administrative Services ● Construction Services  
State of Connecticut**

**1.0 Supplementary Conditions:**

- 1.1 These Supplementary Conditions modify the State of Connecticut, Department of Construction Services, Section 00 72 13 General Conditions of the Contract for Construction for Design – Bid- Build (Rev. 03.26.12 ), and other provisions of the Contract Documents as indicated below. All provisions which are not so modified remain in full force and effect.
- 1.2 The terms used in these Supplementary Conditions which are defined in the Section 00 72 13 General Conditions of the Contract for Construction for Design – Bid- Build (Rev. 03.26.12), have the meanings assigned to them in the General Conditions.

**2.0 Section 00 72 13 General Conditions Of The Contract For Construction For Design - Bid – Build:**

- 2.1 **ADD:** Subsection **3.6** to **ARTICLE 3, CORRELATION OF CONTRACT DOCUMENTS**, as follows:

**3.6** In accordance with Public Act No. 13-247 (Effective June 19, 2013), wherever the term "Commissioner of Construction Services" is used in the "Bidding Documents" or "Project Manual" the term "Commissioner of Administrative Services" shall be substituted in lieu thereof; and wherever the term "Department of Construction Services" is used in "Bidding Documents" or "Project Manual", the term "Department of Administrative Services" shall be substituted in lieu thereof.

- 2.2 **DELETE:** Subsection **28.2** in its entirety from **ARTICLE 28, PARTIAL PAYMENTS**.

**ADD:** Subsection **28.2** to **ARTICLE 28, PARTIAL PAYMENTS**, as follows:

**28.2** In making such Application For Payment for the Work, there shall not be more than **seven** and **one-half percent (7.5%)** deducted from the amount of each Application for Payment to be retained by the Owner as Retainage until Final Completion.

**28.2.1** At **fifty percent (50%)** completion of the Work the Retainage shall be reduced to **five percent (5%)**. All subsequent Applications for Payment shall be subject to **five percent (5%) Retainage**. Upon Substantial Completion, and in the Commissioner's sole discretion and based upon the factors set forth in **Section 28.3**, the Retainage may be reduced upon the request of the Contractor and recommendation of the CT DAS 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 CT DAS Project Manager's estimate of the remaining Work or **two and one-half percent (2.5%)**, whichever is greater. All requests for Retainage Reduction shall be done on **CT DAS Form 7048 General Contractor 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 and based upon factors set forth in **subsection 28.3**, 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%).

- 2.3 **ADD** Subsections **Definitions** to **ARTICLE 1 DEFINITIONS**, as follows:

- 2.3.1 **DELETE:** **1.71** in its entirety from **ARTICLE 1 DEFINITIONS**.

**ADD:** Subsection **1.71** to **ARTICLE 1 PARTIAL DEFINITIONS**, as follows:

**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 and "Work Phase".

**ADD:** Subsection **1.72** to **ARTICLE 1 DEFINITIONS**, as follows:

**1.72** **WORK PHASE:** Construction of the Project by sequence or time intervals, which may include but not be limited to separate Construction Start Dates, Substantial Completion Dates, Application for Payments, Change Orders, Liquidated Damages, Retainage, and Subcontractors for each Work Phase.



2.4 **DELETE:** Appendix 1 from Section 00 72 13.1 in its entirety.  
**ADD:** New Appendix 1 to Section 00 72 13.1 as follows:

	<b>7048</b> <b>General Contractor (GC)</b> <b>Retainage Reduction Request</b> <i>(Sample)</i>
Page 2 of 1	

<b>To:</b>	Department of Administrative Services (DAS) Construction Services Office of Legal Affairs, Policy and Procurement 450 Columbus Blvd, Suite 1302 – North Tower Hartford, CT 06103		
<b>From:</b>	<input type="text" value="GC's Name"/>	General Contractor (GC)	
<b>Subject:</b>	DAS Project Number: <input type="text" value="DAS Project Number"/>		
	Reduction of Retainage at: <input type="text" value="Written Percent"/>	Percent ( <input type="text" value="##.#"/> %)	
<b>Date:</b>	<input type="text" value="Click or tap to enter a date."/>		

In accordance with the General Conditions, Article 28 Progress Payments,  
 ,  
 hereby requests a reduction of retainage to an amount of  Percent (  %)  
 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 General Contractor (GC).

- DAS Construction Services Contractor Performance Evaluation Score is a minimum of **Sixty (60%) Percent**.
- Timely submission of an appropriate and complete CPM 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 required Contract Document submissions including but not limited to Shop Drawings, material certificates, material samples and the prompt resolution of the Owner's and/or A/E'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.
- All approved credit Change Orders have been invoiced.
- All Change Order requests for pricing are current.
- The GC has and is maintaining a clean worksite in accordance with the Contract Documents.
- All Subcontractor payments are current at the time of reduction request.
- GC is compliant with set-aside provisions of the contract.

<b>General Contractor Certification:</b>	<input type="text"/> <i>(Written Name)</i>	<input type="text"/> <i>(Signature)</i>	<input type="text"/> <i>(Date)</i>
<b>Project Manager Recommendation:</b>	<input type="text"/> <i>(Written Name)</i>	<input type="text"/> <i>(Signature)</i>	<input type="text"/> <i>(Date)</i>
<b>DAS Chief Engineer or Authorized Representative:</b>	<input type="text"/> <i>(Written Name)</i>	<input type="text"/> <i>(Signature)</i>	<input type="text"/> <i>(Date)</i>

**END**

CT DAS – 7048 (Rev. 05.22.17) 7000 – Construction Phase Forms

**END OF SECTION**



**State Of Connecticut  
Department of Administrative Services  
Construction Services**

March 26, 2015

**To:** All Department of Administrative Services, Construction Services Contractors

**Subject:** Set-Aside Contract Laws

Dear Sir/Madam:

The administration of Governor Dannel P. Malloy is committed to supporting the subject programs by encouraging all contractors on State projects to improve their efforts in these areas.

State law requires contractors doing business with the State to demonstrate non-discrimination by making "good faith efforts" in both hiring and in sub-contracting practices General Statute Section (C.G.S. §) 4a-60.

What does "good faith efforts" mean? It means that you, as contractors, must act affirmatively. It is not good enough to say you can't find minorities and women. You must seek them out. That is the law, and the Department of Administrative Services (DAS) / Construction Services (CS) is committed to enforcing the law. At the same time, we are ready to assist you in making "good faith efforts."

DAS is required by C.G.S. § 4a-60g (b) and (c) to set aside projects (amounting to **twenty-five percent (25%)** of its annual contract awards) for small business and **twenty-five percent (25%)** of that amount for minority business enterprises. DAS may require any general contractor to set aside a portion of the contract for subcontractors who are small businesses or minority business enterprises in lieu of setting aside a project or in addition to setting aside a project.

Therefore, unless otherwise specified in the **Bid Proposal Form**, DAS will require contractors to subcontract **twenty-five percent (25%)** of the total contract value to small businesses certified by DAS and further will require contractors to subcontract 25% of that 25% to minority and women small contractors certified as minority business enterprises by DAS. These statutory goals represent the minimum values expected to be achieved by this program.

Together, we can meet the challenge of providing equal opportunity for minority and women-owned businesses and workers in our State. We expect superior results in the areas of affirmative action, equal employment opportunity, and set-aside contracts. The DAS standard in these areas is not just minimal effort. Our goal is to uphold the letter and the spirit of the law.

For more information on Non-Discrimination and Affirmative Action Provisions for State Contracts please visit the Commission on Human Rights and Opportunities (**CHRO**) Website at [www.ct.gov/chro](http://www.ct.gov/chro).

Sincerely yours,

Melody A. Currey  
Commissioner

PB:pb

## Non-Discrimination and Affirmative Action Provisions for State Contracts

Section 1	CHRO – Contract Compliance Regulations Notification to Bidders:
1.1	<p>The contract to be awarded is subject to contract compliance requirements mandated by:</p> <ul style="list-style-type: none"><li>1.1.1 The <b>Connecticut General Statutes (C.G.S.) § 4a-60</b> and <b>4a-60a</b>;</li><li>1.1.2 <b>C.G.S. § 46a-71(d)</b> and <b>46a-81i (d)</b> when the awarding agency is the State; and</li><li>1.1.3 The <b>Contract Compliance Regulations</b> codified in the <b>Regulations of Connecticut State Agencies (RSCA) §46a-68j-21 through 43</b>, which establish a procedure for awarding all contracts covered by <b>C.G.S. §4a-60</b> and <b>46a-71(d)</b>.</li></ul>
1.2	<p>According to the <b>Contract Compliance Regulations §46a-68j-30(9)</b>, 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.”</p> <p>“<b>Minority business enterprise</b>” is defined in <b>C.G.S §4a-60</b>-as a small contractor or supplier of materials fifty-one (51%) percent or more of the capital stock or assets of which is owned by a person or persons:</p> <ul style="list-style-type: none"><li>1.2.1 who are active in the daily affairs of the enterprise;</li><li>1.2.2 who have the power to direct the management and policies of the enterprise; and</li><li>1.2.3 who are members of a minority, as such term is defined in subsection (a) of <b>C.G.S. §32-9n.</b>”</li></ul>
1.3	<p>“<b>Minority</b>” groups are defined in <b>C.G.S. §32-9n</b> as:</p> <ul style="list-style-type: none"><li>1.3.1 Black Americans, including all persons having origins in any of the Black African racial groups not of Hispanic origin;</li><li>1.3.2 Hispanic Americans, including all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;</li><li>1.3.3 Persons who have origins in the Iberian Peninsula, including Portugal, regardless of race;</li><li>1.3.4 Women;</li><li>1.3.5 Asian Pacific Americans and Pacific Islanders; or</li><li>1.3.6 American Indians and persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.</li><li>1.3.7 “<b>Individuals with a disability</b>” is also a minority business enterprise as provided by C.G.S. § 4a-60g (4).</li></ul>
1.4	<p>The above “<b>Minority business enterprise</b>” definitions apply to the contract compliance requirements by virtue of <b>Contract Compliance</b> Regulations §46a-68j-21(11).</p> <p>The awarding agency will consider the following factors when reviewing the bidder’s qualifications under the contract compliance requirements:</p> <ul style="list-style-type: none"><li>1.4.1 the bidder’s success in implementing an affirmative action plan;</li><li>1.4.2 the bidder’s success in developing an apprenticeship program complying with <b>RSCA §46a-68-1 to 46a-68-17</b>, inclusive;</li><li>1.4.3 the bidder’s promise to develop and implement a successful affirmative action plan;</li><li>1.4.4 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</li><li>1.4.5 the bidder’s promise to set aside a portion of the contract for legitimate minority business enterprises. See <b>Contract Compliance Regulations § 46a-68j-30(10) (E)</b>.</li></ul>

**Note:** The Commission on Human Rights and Opportunities (CHRO) “Employment Information Form” shall be submitted to the DAS/CS Office of Legal Affairs, Policy, and Procurement on behalf of the awarding agency, the Department of Administrative Services (DAS).

<b>Section 2</b>	<b>Non-Discrimination and other Contract Compliance Requirements:</b>
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Pursuant to **C.G.S. § 4a-60** and **§4a-60a** and the **RSCA §46a-68j-21 to 46a-68j-43**, a contractor agrees to the following:

- 2.1** Not to 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, sexual orientation, mental retardation, or physical disability including, but not limited to, blindness (unless it is shown that such disability prevents performance of the work involved) in the performance of a contract, in any manner prohibited by the federal and Connecticut anti-discrimination and contract compliance laws;
- 2.2** To undertake affirmative action which will insure that applicants with job-related qualifications are employed and that employees are treated, when employed, without regard to whether they belong to any of the groups identified in Paragraph # 1) above;
- 2.3** To include a statement that the contractor is an “affirmative action-equal opportunity employer”, in all solicitations or advertisements for employees placed by or on behalf of the contractor;
- 2.4** To provide each labor union or representative of workers with which such contractor has a collective bargaining agreement and each vendor with which such contractor has a contract, a notice advising them of the contractor’s commitments under **C.G.S. § 4a-60** and **§4a-60a**. The notice is available by contacting **CHRO**;
- 2.5** To post copies of the notice referred to in item 4) in conspicuous places available to employees and applicants;
- 2.6** To provide **CHRO** with such information requested by said agency, permit access to pertinent books, records, and accounts, concerning the employment practices and procedures of the contractor as relate to the provisions of **C.G.S. §4a-60, §4a-60a** and **§46a-56** and, cooperate fully with **CHRO**; and,
- 2.7** To include the language of **C.G.S. § 4a-60 (a)** and **§4a-60a (a)** in every subcontract or purchase order executed to fulfill any obligation of the contract with DAS.

<b>Section 3</b>	<b>Affirmative Action Requirements for Certain Public Works Contracts for Construction:</b>
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Pursuant to **C.G.S. § 46a-68c** and **§46a-68d** and, the **RSCA § 46a-68j-21 to 46a-68j-29**, the following must file an affirmative action plan with the Commission:

- 3.1** A successful bidder on a <sup>1</sup> “**public works contract**” with a value of **\$500,000** or more. The plan must be filed within **thirty (30)** days after a bid has been accepted by an awarding agency but before a contract is awarded. A plan may be filed in advance of or, at the same time as a bid is submitted.
- 3.2** A contractor with **fifty (50)** or more employees who has been awarded a “**public works contract**” in excess of **\$50,000** in any fiscal year. A plan must be filed within **thirty (30) days** of the date a contract is awarded.

**CHRO** must review a plan within **sixty (60) days** of receipt and must either approve or reject a plan. Should **CHRO** approve an affirmative action plan, **CHRO** will issue a certificate of compliance. This certificate of compliance shall be proof of a successful bidder’s or a contractor’s eligibility to bid or be awarded contracts for a period of **two (2)** years from the date of the certificate. This certificate does not excuse a successful bidder or contractor from being monitored by the **CHRO** for implementation of its affirmative action plan or, from its reporting requirements under **C.G.S. 46a-68e** and **§ 46a-68f**. (Refer to Section 6) Also, **CHRO** may revoke the certificate if a successful bidder or contractor does not implement its affirmative action plan.

Should **CHRO** opt to disapprove an affirmative action plan, **CHRO** must notify the successful bidder or contractor in writing within **ten (10) days** of the disapproval. The notice will state the reason for disapproval and may provide necessary proposals to bring the plan into compliance. The successful bidder or contractor must then submit a new or amended plan, within **thirty (30) days** of the date the notice of disapproval is mailed by **CHRO**.

**Section 3**

(Continued):

In addition, **CHRO** may conditionally approve an affirmative action plan for a successful bidder on a public works contract valued at **\$500,000** or more. **CHRO** must notify the successful bidder in writing within **ten (10) days** of the conditional disapproval and state the reason for conditional approval and, may provide necessary proposals to bring the plan into compliance. The successful bidder must then submit a new or amended plan or, provide written assurances that it will amend its plan to conform to affirmative action requirements, within **thirty (30) days** of the date the notice is mailed by **CHRO**.

**Note:** The awarding agency (DAS) will provide a successful bidder or contractor with a copy of **CHRO**'s Affirmative Action Plan format. All sections of this Affirmative Action Plan format must be completed by the successful bidder or contractor and forwarded to **CHRO**. Also, the awarding agency (DAS) shall withhold **2%** of the total contract price per month from any payment made to a contractor until such time as the contractor has developed an affirmative action plan, which has been approved by **CHRO**.

<sup>1</sup> **“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.-**C.G.S. § 46a-68b**.

**Section 4**

**“Good Faith Efforts” to Include Minority Business Enterprises as Subcontractors”:**

In addition to, or in the absence of, any other subcontractor requirements included in this project, contractors are required to make <sup>2</sup> **“good faith efforts”** to include minority business enterprises in the work of this project as subcontractors (for services and/or material suppliers). For the purpose of identifying minority business enterprises, a minority business enterprise shall be a subcontractor which has a valid certification as such from DAS and/or a subcontractor for which an affidavit has been submitted by the contractor attesting that the subcontractor named as a minority business enterprise meets the minority business enterprise criteria set out in **C.G.S. § 4a-60(b)**.

<sup>2</sup> **“Good faith efforts”** means *“that **degree of diligence** which a reasonable person would exercise in the performance of legal duties and obligations”* and includes, but is not limited to, the following **factors**: the contractor’s employment and subcontracting policies and practices; affirmative advertising, recruitment, training, technical assistance activities and such other reasonable activities or efforts as **CHRO** may recommend to ensure the participation of minority business enterprises in state projects.

<b>Section 5</b>	<b>Set-Aside Program:</b>
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This contract may be subject to the provisions the **Set-Aside Program for Small Contractors** found at **C.G.S. § 4a-60g** and may be awarded only to a contractor certified as a small and/or minority business enterprise by DAS. The notification as to this special provision will be found in the **Bid Proposal Form** for this contract. The listing of eligible "Set-Aside" contractors is found on the [DAS Website for SBE or MBE Certification](#). In the event that the **Set-Aside Program for Small Contractors** applies to this contract, the following special provisions will also apply:

**5.1 Amount of Work Required to Be Done by "Set-Aside" Contractors**

A contractor awarded a contract on a project pursuant to the provisions of **C.G.S. § 4a-60g**, as amended, shall be required to perform not less than **thirty (30)** per cent of the work with his/her own forces and shall ensure that not less than **fifty (50)** per cent of the work be performed by contractors or subcontractors who are certified as small contractors or minority business enterprises pursuant to **C.G.S. § 4a-60g**.

The primary product/service performed by contractors working on a contract awarded under **C.G.S. § 4a-60g** must be the same as the primary product/service described for the contractors on their "Certificate of Eligibility" which is provided to them by DAS.

**5.2 Alternate Bonding Available to "Set Aside" Contractors**

In lieu of a performance, bid, labor and materials or other required bond, a contractor or subcontractor awarded a contract under **C.G.S. § 4a-60g** may provide to the awarding authority (DAS) and the awarding authority shall accept a "Letter of Credit". Any such "Letter of Credit" shall be in an amount equal to **ten per cent (10%)** of the contract for any contract that is less than **one hundred thousand (\$100,000) dollars**, and in the amount of **twenty-five per cent (25%)** for any contract that is **one hundred thousand (\$100,000) dollars** or more.

**5.3 Procedures to Follow Regarding Substitution of Named Project "Set-Aside" Subcontractors.**

The awarding authority (DAS) 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 **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.

Pursuant to **C.G.S. § 4b-95**, the term "**good cause**" includes but is not limited to a subcontractor's or, where appropriate, a general contractor's:

- 5.3.1** Death or physical disability, if the listed subcontractor is an individual;
- 5.3.2** Dissolution, if a corporation or partnership;
- 5.3.3** Bankruptcy;
- 5.3.4** Inability to furnish any performance and payment bond shown on the bid form;
- 5.3.5** Inability to obtain, or loss of, a license necessary for the performance of the particular category of work;
- 5.3.6** Failure or inability to comply with a requirement of law applicable to contractors and subcontractors, or to subcontracts for construction, alteration, or repair projects;
- 5.3.7** Failure to perform his/her agreement to execute a subcontract under **C.G.S. § 4b-96**.

Any general contractor who violates any provision of **C.G.S. § 4b-95** shall be disqualified from bidding on other contracts that are subject to the provisions of **Chapter 60 - Construction and Alterations of State Buildings of the C.G.S.**, for a period **not to exceed twenty-four (24) months**, commencing from the date on which the violation is discovered, for each violation.

<b>Section 6</b>	<b>Contract Monitoring and Reporting:</b>
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- 6.1 CHRO** has the authority to monitor state contractors pursuant to **C.G.S. § 46a-68e** and **46a-68f** and **RSCA-§46a-68j-23(3)**. In addition, under the **RSCA §46a-68j-25(e)** and **46a-68j-26 (g)**, **CHRO** has the authority to monitor the implementation of an affirmative action plan regarding:
- 6.1.1** a successful bidder who has been awarded a public works contract valued at **\$500,000 or more** and;
  - 6.1.2** a contractor with **fifty (50)** or more employees who has been awarded a public works contract **in excess of \$50,000 in any fiscal year**.
- 6.2** In order to monitor the implementation of these plans **CHRO** requires that the following contract monitoring reports be compiled and submitted:
- 6.2.1 Monthly Employment Utilization Report (Form CHRO: 257):** A contractor, on behalf of itself and all subcontractors who perform work on the project during a given month, is required to report on the work hour participation of minority male and female workers in each trade category on the project. The report must be submitted to the contract awarding agency (**DAS**) and to the Commission by the 15<sup>th</sup> day following the end of each calendar month during the term of the on-site construction work of the project.  
**Website page:** <http://www.ct.gov/chro>, then click on **Forms**, then click on **Contract Compliance Forms and Reports**.
  - 6.2.2 Quarterly Small Contractor and Minority Business Enterprise Payment Status Report (Form CHRO: 258).** A contractor is required to report on the participation of small contractors or minority business enterprises identified to participate on the project. The report must be submitted to the contract awarding agency (**DAS**) and to the Commission by the 15<sup>th</sup> day following the end of each calendar quarter during the term of the on-site construction work of the project.  
**Website page:** <http://www.ct.gov/chro>, then click on **Forms**, then click on **Contract Compliance Forms and Reports**.
  - 6.2.3** In addition, the Commission expects that a contractor will designate an Equal Opportunity/Contract Compliance Officer for its public works project who will compile the above monthly and quarterly reports, as well as, undertake the following responsibilities for implementation of its project Affirmative Action Plan (AAP):
    - .1** Maintain a project Equal Employment Opportunity (EEO) file to include all records, correspondence and other documentation relate to the project AAP.
    - .2** Communicate to and inform all project subcontractors, regardless of tier, and labor referral organizations (if applicable) about project equal employment and AAP commitments and performance requirements.
    - .3** Participate in project job meetings to inform project subcontractors about project equal employment and AAP performance requirements.
    - .4** Track the use of employment recruitment sources identified in the project AAP regarding all employment opportunities with all subcontractors on the project. Also, maintain documentation of all contacts with these recruitment sources and their responses.

The Commission will forward a copy of the monthly and quarterly report to each contractor on a public works project.

<b>NOTES:</b>	Bidders and state contractors may review the full text of the before referenced Connecticut General Statutes by accessing either the State Law Library's web site ( <a href="http://www.cslib.org/psaindex.htm">http://www.cslib.org/psaindex.htm</a> ) or the State Legislatures' web site ( <a href="http://www.cga.ct.gov">http://www.cga.ct.gov</a> ).
	The full text of the RSCA 46a-68j-21 through 46a-68j-43 may be reviewed by accessing the Commission's web site: <a href="http://www.ct.gov/chro/cwp/view.asp?a=2525&amp;Q=315900&amp;chroPNavCtr=#45679">http://www.ct.gov/chro/cwp/view.asp?a=2525&amp;Q=315900&amp;chroPNavCtr=#45679</a> In the alternative, bidders or state contractors may request a copy of these state statutes and regulations by contacting the Commission at (860) 541-3400 (in Hartford) or 1 (800) 477-5737.

<b>Section 7</b>	<b>CHRO Contract Compliance Forms:</b>
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The following CHRO Contract Compliance Forms are available on the CHRO Website:

- 7.1 **Monthly Employment Utilization Report (Form CHRO-257 and CHRO-257a):**
  - <http://www.ct.gov/chro/lib/chro/257s.pdf>
- 7.2 **Cumulative Utilization Report (Form CHRO-257b):**
  - <http://www.ct.gov/chro/lib/chro/257b.pdf>
- 7.3 **Monthly Small Contractor & MBE Payment Status Report (Form CHRO-258a) and Quarterly Small Contractor & MBE Payment Status Report (Form CHRO-258):**
  - <http://www.ct.gov/chro/lib/chro/258s.pdf>

**End of Section**  
**00 73 38 CHRO / Contract Compliance Regulations**





**Minimum Rates and Classifications  
 for Building Construction**

**Connecticut Department of Labor  
 Wage and Workplace Standards Division**

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 pages 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 sub-contractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his hourly wage.

<b>Project Number:</b>	<b>BI-N-341</b>	<b>Project Town:</b>	<b>Middletown, CT</b>
<b>Project: Cooling Tower Replacement</b>			
<b>1111 Country Club Road</b>			
<b>Middletown, CT</b>			

The following pages contain:

Contractors Wage Certification Form	1 page
Notice to all Mason Contractors reference Section 31-53 of C.G.S. (Prevailing Wages)	1 page
Prevailing Wage Rates - English	15 pages
Informational Bulletin - <b>Occupational Classifications</b>	0 pages
Informational Bulletin – <b>The 10-Hour OSHA Construction Safety and Health Course</b>	2 pages
Footnotes	2 pages
Special Notice re: Wage Rate Adjustments	1 pages
Weekly Payroll Certification Form (WWS-CP1)	1 page
Fringe Benefits Explanation (P)	1 page
Weekly Payroll Certification Form (WWS-CP2)	1 page

**As of: March 27, 2018**





Opportunity \* Guidance \* Support



# **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.



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): \_\_\_\_\_



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.

**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.



Project: Cooling Tower Replacement At 1111 Contry Club Road

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**Minimum Rates and Classifications  
for Building Construction**

ID# : B 24585

**Connecticut Department of Labor  
Wage and Workplace Standards Division**

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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: BI-N-341

Project Town: Middletown

State#:

FAP#:

Project: Cooling Tower Replacement At 1111 Contry Club Road

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<b>CLASSIFICATION</b>	<b>Hourly Rate</b>	<b>Benefits</b>
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
<hr/>		
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**		
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1c) Asbestos Worker/Heat and Frost Insulator	39.00	28.76

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*As of:* **Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

2) Boilermaker	38.34	26.01
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3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	33.48	32.06 + a
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3b) Tile Setter	34.90	25.87
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3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
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3d) Tile, Marble & Terrazzo Finishers	26.70	21.75
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3e) Plasterer	33.48	32.06
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

-----LABORERS-----

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4) Group 1: Laborers (common or general), acetylene burners, carpenter tenders, concrete specialists, wrecking laborers, fire watchers.	29.25	19.50
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4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	29.50	19.50
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4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	29.75	19.50
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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.	29.75	19.50
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4d) Group 5: Air track operator, sand blaster and hydraulic drills.	29.75	19.50
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

4e) Group 6: Blasters, nuclear and toxic waste removal.	31.00	19.50
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4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	30.25	19.50
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4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	28.38	19.50
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4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	27.86	19.50
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4i) Group 10: Traffic Control Signalman	16.00	19.50
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5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	32.60	25.34
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

5a) Millwrights	33.14	25.74
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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)	39.15	25.17+3% of gross wage
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7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	51.71	32.645+a+b
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-----LINE CONSTRUCTION-----

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Groundman	26.50	6.5% + 9.00
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Linemen/Cable Splicer	48.19	6.5% + 22.00
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**As of: Tuesday, March 27, 2018**



Project: Cooling Tower Replacement At 1111 Contry Club Road

8) Glazier (Trade License required: FG-1,2)	36.28	20.45 + a
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9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	35.47	33.39 + a
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----OPERATORS----

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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)	39.30	24.05 + a
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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)	38.98	24.05 + a
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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)	38.24	24.05 + a
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	37.85	24.05 + a
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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)	37.26	24.05 + a
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Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	37.26	24.05 + a
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Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	36.95	24.05 + a
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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).	36.61	24.05 + a
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Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	36.21	24.05 + a
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

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).	35.78	24.05 + a
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Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	33.74	24.05 + a
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Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	33.74	24.05 + a
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Group 12: Wellpoint operator.	33.68	24.05 + a
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Group 13: Compressor battery operator.	33.10	24.05 + a
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Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	31.96	24.05 + a
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	31.55	24.05 + a
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Group 16: Maintenance Engineer/Oiler.	30.90	24.05 + a
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Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	35.21	24.05 + a
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Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	32.79	24.05 + a
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-----PAINTERS (Including Drywall Finishing)-----

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10a) Brush and Roller	32.72	20.45
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

10b) Taping Only/Drywall Finishing	33.47	20.45
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10c) Paperhanger and Red Label	33.22	20.45
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10e) Blast and Spray	35.72	20.45
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11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	41.62	30.36
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12) Well Digger, Pile Testing Machine	33.01	19.40 + a
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13) Roofer (composition)	35.67	19.28
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

14) Roofer (slate & tile)	36.17	19.28
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15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	37.18	34.29
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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)	41.62	30.36
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-----TRUCK DRIVERS-----

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17a) 2 Axle	29.13	22.32 + a
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17b) 3 Axle, 2 Axle Ready Mix	29.23	22.32 + a
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**As of: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

17c) 3 Axle Ready Mix	29.28	22.32 + a
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17d) 4 Axle, Heavy Duty Trailer up to 40 tons	29.33	22.32 + a
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17e) 4 Axle Ready Mix	29.38	22.32 + a
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17f) Heavy Duty Trailer (40 Tons and Over)	29.58	22.32 + a
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17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	29.38	22.32 + a
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18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	43.92	15.84 + a
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**As of: Tuesday, March 27, 2018**



Project: Cooling Tower Replacement At 1111 Contry Club Road

19) Theatrical Stage Journeyman

25.76

7.34

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***As of:* Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

*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 journeyman 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](http://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: Tuesday, March 27, 2018**

Project: Cooling Tower Replacement At 1111 Contry Club Road

*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: Tuesday, March 27, 2018**



# **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](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 ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.**

**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 4<sup>th</sup>, 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.



## 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](http://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.**



[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.

**PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS**

**WEEKLY PAYROLL**

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

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

CONTRACTOR NAME AND ADDRESS:											SUBCONTRACTOR NAME & ADDRESS				WORKER'S COMPENSATION INSURANCE CARRIER					
PAYROLL NUMBER	Week-Ending Date	PROJECT NAME & ADDRESS									POLICY #				EFFECTIVE DATE:		EXPIRATION DATE:			
PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE							Total ST Hours	BASE HOURLY RATE	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				S	M	T	W	TH	F	S	Total O/T Hours				FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER		
				HOURS WORKED EACH DAY																
												\$	1. \$							
												Base Rate	2. \$							
													3. \$							
												\$	4. \$							
												Cash Fringe	5. \$							
													6. \$							
												\$	1. \$							
												Base Rate	2. \$							
													3. \$							
												\$	4. \$							
												Cash Fringe	5. \$							
													6. \$							



**\*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)



Weekly Payroll Certification For  
Public Works Projects (Continued)

**PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS**

Week-Ending Date:  
Contractor or Subcontractor Business Name:

**WEEKLY PAYROLL**

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION  Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE							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				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				S	M	T	W	TH	F	S					FICA	FEDERAL WITH- HOLDING	STATE WITH- HOLDING	OTHER		
				HOURS WORKED EACH DAY																
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$								

\*IF REQUIRED





## Additional Forms to Be Submitted After Bond Commission Funding Approval

DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement

<b>Table of Contents</b>	<b>No. of Pages</b>
<b>Performance Bond</b>	<b>2</b>
<b>Labor And Material Bond</b>	<b>2</b>
<b>Surety Sheet</b>	<b>1</b>
<b>Bidder's Certification: Financial Position and Corporate Structure</b>	<b>1</b>

**PERFORMANCE BOND**  
**Know All Men by These Presents**

**THAT** [ ] of the  
Town of [ ], County [ ] and  
State of [ ], as Principal (hereinafter called the Principal),  
and [ ], [ ]

*(Insert place of Business)*

(a surety company authorized to transact business in the State Of Connecticut) as Surety(ies) (hereinafter called the Surety) are held and firmly bound unto the State of Connecticut (hereinafter called the Obligee) in the full penal sum of

[ ]

(\$ [ ] ) Dollars, lawful money of the United States, to be paid to said State of Connecticut, to the which payment well and truly to be made and done, the said Principal binds himself, his heirs, executors, administrators and assigns (or itself, its successors and assigns), and the said Surety (ies) binds itself, its successors and assigns jointly and severally firmly by these presents.

Signed, sealed and delivered this [ ] day of [ ] 20 [ ] .

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT**

**WHEREAS** said Principal will enter into a certain written contract with said Obligee, to be dated-the

[ ] day of [ ] 20 [ ] , which written , as amended, contract shall provide for the following:

- Project Title:** [ ]
- Project Location:** [ ]
- Contract Number:** [ ]
- Project Number:** [ ]

which contract, including any hereafter made extension, modification or alteration thereof, together with all plans and specifications now made or which may hereafter be made in extension, modification or alteration thereof, is hereby referred to, incorporated in, and made a part of this bond as though herein fully set forth.

**NOW, THEREFORE**, if the said Principal shall well and truly keep, perform and execute all the undertaking, covenants, terms, conditions, and agreements of said contract, as it may be extended, modified or altered, and during the *period* of any guaranty required under the contract, according to its provisions on his or its part to be kept and performed or shall indemnify and reimburse the Obligee for any loss that it may suffer through the failure of the Principal to faithfully observe and perform each and every obligation and duty imposed upon the Principal by the said contract, as it may be extended, modified or altered, at the time and in the manner therein specified, then this obligation shall be null and void, otherwise it shall remain and be in full force and effect.

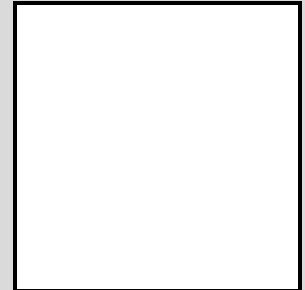
Any alterations which may be made in the terms of the contract, or in the work done or to be done under it, or the giving by the Obligee of any extension of time for the performance of the contract or any other forbearance on the part of either the Obligee or the Principal, one to the other, shall not in any way release the Principal, and/or the Surety(ies) or either of them, their representatives, heirs, executors, administrators, successors or assigns from liability hereunder, and notice to the Surety(ies) of any such alteration, modification, extension or forbearance is hereby specifically and absolutely waived.

In the event that the Surety(ies) assumes the contract or obtains a bid or bids for completion of the contract, the Surety(ies) shall ensure that the contractor chosen to complete the contract is prequalified pursuant to section 4a-100 of the Connecticut General Statutes, in the requisite classification and has the aggregate work capacity rating and single project limit necessary to complete the contract.

**IN TESTIMONY WHEREOF**, the said Principal has hereunto set his / its hand and seal, and the said Surety(ies) has/have caused this instrument to be signed by its/their attorney in fact and its corporate seal to be hereunto affixed, the day and year first written.

**Witness as to Principle**

**SEAL**



(Print Name)

, Its

Duly Authorized

(Print Name)

**Witness as to Surety**

**SEAL**



(Print Name)

by

Its attorney in fact

(Print Name)

**Note:** If more than one surety, add additional lines for additional surety name and address, person signing and title, and two witnesses. Obtain Power of Attorney for each surety.

**End Performance Bond**

**LABOR AND MATERIAL BOND  
Know All Men by These Presents**

**THAT** [ ] of the  
Town of [ ], County [ ] and  
State of [ ], as Principal (hereinafter called the Principal),  
and [ ], [ ]  
(Insert place of Business)

(a surety company authorized to transact business in the State Of Connecticut) as Surety(ies) (hereinafter called the Surety) are held and firmly bound unto the State of Connecticut (hereinafter called the Obligee) in the full penal sum of

[ ]  
(\$ [ ]) Dollars, lawful money of the United States, to be paid to said State of Connecticut, to the which payment well and truly to be made and done, the said Principal binds himself, his heirs, executors, administrators and assigns (or itself, its successors and assigns), and the said Surety (ies) binds itself, its successors and assigns jointly and severally firmly by these presents.

Signed, sealed and delivered this [ ] day of [ ] 20 [ ] .

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT**

**WHEREAS** said Principal will enter into a certain written contract with said Obligee, to be dated the [ ] day of [ ] 20 [ ] , which written, as amended, contract shall provide for the following:

- Project Title:** [ ]
- Project Location:** [ ]
- Contract Number:** [ ]
- Project Number:** [ ]

which contract, including any hereafter made extension, modification or alteration thereof, together with all plans and specifications now made or which may hereafter be made in extension, modification or alteration thereof, is hereby referred to, incorporated in, and made a part of this bond as though herein fully set forth.

**NOW, THEREFORE**, if the said Principal shall promptly pay for all materials furnished and labor supplied or performed in the prosecution of the work included in and under the aforesaid contract, as it may be extended, modified or altered, and/or required by the General Statutes of Connecticut, as amended, whether or not the material or labor enters into and becomes a component part of the real asset, then this obligation shall be null and void, otherwise it shall remain and be in full force and effect. This bond is provided pursuant to Section 49-41 et seq. of the General Statutes of Connecticut and shall be governed thereby.

Any party, whether a subcontractor or otherwise, who furnishes materials or supplies or performs labor or services in the prosecution of the work under said contract, as it may be extended, modified or altered, and who is not paid therefor, may bring a suit on this bond in the name of the person suing and prosecute the same to final execution and judgment for such sum or sums as may be justly due.

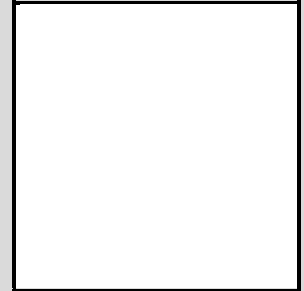
Any alterations which may be made in the terms of the contract, or in the work done or to be done under it, or the giving by the Obligee of any extension of time for the performance of the contract or any other forbearance on the part of either the Obligee or the Principal, one to the other, shall not in any way release the Principal, and/or the Surety(ies) or either of them, their representatives, heirs, executors, administrators, successors or assigns from liability hereunder, and notice to the Surety(ies) of any such alteration, modification, extension or forbearance is hereby specifically and absolutely waived.

In the event that the Surety(ies) assumes the contract or obtains a bid or bids for completion of the contract, the Surety(ies) shall ensure that the contractor chosen to complete the contract is prequalified pursuant to section 4a-100 of the Connecticut General Statutes, in the requisite classification and has the aggregate work capacity rating and single project limit necessary to complete the contract.

**IN TESTIMONY WHEREOF**, the said Principal has hereunto set his / its hand and seal, and the said Surety(ies) has/have caused this instrument to be signed by its/their attorney in fact and its corporate seal to be hereunto affixed, the day and year first written.

**Witness as to Principle**

**SEAL**



(Print Name)

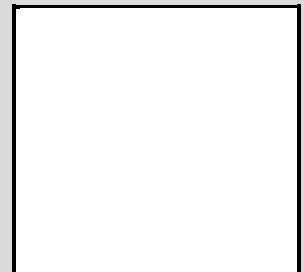
, Its

Duly Authorized

(Print Name)

**Witness as to Surety**

**SEAL**



(Print Name)

by

Its attorney in fact

(Print Name)

**Note:** If more than one surety, add additional lines for additional surety name and address, person signing and title, and two witnesses. Obtain Power of Attorney for each surety.

**End Labor and Material Bond**

## Surety Sheet

State Of Connecticut  
Department of Administrative Services, Construction Services  
Office of Legal Affairs, Policy, and Procurement  
450 Columbus Boulevard, Suite 1302  
Hartford, CT 06103

### 1. Surety Company

Name of Surety Co.:

Address of Home Office:

Telephone Number:

### 2. Agent

Name of Surety Co.:

Address of Agency:

Telephone Number:

Attorney-In-Fact:

Telephone Number:

DAS Project Number:

Contractor's Name:

*End Surety Sheet*

**Bidder's Certification:  
Financial Position and Corporate Structure**

*(Your Name)*

*(Name Of Company)*

The bidder for this contract (hereinafter "bidder"), certifies under penalty of false statement that the information in the bid is true, that there has been no substantial change in the bidder's financial position or corporate structure since its most recent prequalification certificate was issued or renewed pursuant to CGS § 4b-91, as amended, other than those changes noted in the update statement, and that the bid was made without fraud or collusion with any person.

*(Signature)*

*(Print Name)*

*(Date)*

*(DAS Project Number)*

***End Bidder's Certification: Financial Position and Corporate Structure***

**End of Section  
00 92 10 Additional Forms To Be Submitted After Bond Commission Funding Approval**





## Procedures Regarding Taxation For Nonresident General / Prime Contractor and Subcontractors

**DAS | Construction Services | Office of Legal Affairs, Policy, and Procurement**

According to [Connecticut General Statutes § 12-430\(7\)](#), there are two types of Nonresident Contractors and Subcontractors (*Verified* or *Unverified*) who are required to furnish security for Connecticut taxes arising from jobs performed in Connecticut.

Detailed information can be found by visiting the Connecticut Department of Revenue Services (DRS) website at [www.ct.gov/drs](http://www.ct.gov/drs):

- Under the “**For Businesses**” title, click on “**Withholding Tax**”;
- Click on “**Registering**”;
- Click on “**5. What tax types do I need to register for with DRS**”;
- Read the information for “**Out-of-State**” contractors.
- Click on “[SN 2012\(2\)](#)” for the “Procedure Governing Nonresident Contractors”.

Forms can be downloaded from the DRS website ([www.ct.gov/drs](http://www.ct.gov/drs)) as follows:

- Click on “**Forms**” at the top of the page;
- Under “**Current Year Forms**”:
  - Click on “**Miscellaneous Tax Forms**”;
  - Click on “**Bond Forms**”
- Download the appropriate form.

For questions regarding the nonresident contractor bond law, call **DRS** at **860-541-7538**.

### 1.0 Verified Nonresident Contractors and Subcontractors

Verified Nonresident Contractors are treated just like Resident Contractors. A Verified Nonresident General or Prime Contractor is not required to file a surety bond with DRS. A Verified Nonresident Subcontractor is not required for the General or Prime Contractor to hold back a portion of the amount owed the Subcontractor under the contract.

#### 1.1 Verification Procedure for General/Prime Contractors and Subcontractors:

**1.1.1 Register with DRS** via REG-1 for all appropriate taxes.

**1.1.2 Submit Form AU-960 “Nonresident Contractor Request for Verified Contractor Status” to DRS.** If you have a 3 year filing history with DRS and no delinquencies, then just complete **Part I & Part I**, otherwise go to **Part III**.

**1.1.3 Submit Form AU-961 “Verification Bond” to DRS.**

**1.1.4** If Verified by DRS, submit “**Notice of Verified Status**” (Verification Letter issued by DRS) to the Connecticut Department of Administrative Services / Construction Services (DAS/CS) Office of Legal Affairs, Policy, and Procurement as specified in Section 00 41 00 Bid Proposal Form.

**2.0 Unverified Nonresident Contractors and Subcontractors  
(for Contracts Greater Than \$250,000):**

The requirements for Unverified Nonresident Contractors and Unverified Nonresident Subcontractors (for Contracts greater than \$250,000) are different for General/Prime Contractors and their Subcontractors:

**2.1 Unverified Nonresident General or Prime Contractors:**

- 2.1.1** Submit **Form AU-964 “Surety Bond and Release” to DRS**. The Unverified Nonresident General/Prime Contractor is required to file a good and valid surety bond with DRS using Form AU-964 “Surety Bond and Release” for 5% of the contract price to secure payment of required taxes by both the General/Prime Contractor and its Subcontractors.
- 2.1.2** The General/Prime Contractor must provide proof to DAS/CS that they have posted a good and valid surety bond with DRS by providing a copy of **Form AU-965 “Acceptance of Surety Bond”** that verifies acceptance of the bond by DRS\*.

**2.2 Unverified Nonresident Subcontractors:**

- 2.2.1** The Resident or Verified or Unverified Nonresident General/Prime Contractor is required to hold back 5% of its payments to the Unverified Nonresident Subcontractor. The General/Prime Contractor must keep the hold-backs in a special fund in trust for the state.
- 2.2.2** The Unverified Nonresident Subcontractor can request that the money be released from the General/Prime Contractor by submitting **Form AU-967 “Request for Certificate of Compliance” to DRS**. It must be signed by the General/Prime Contractor and the Nonresident Subcontractor and submitted **to DRS within 90 days of the completion date**.
- 2.2.3** If **Form AU-968 “Certificate of Compliance”** is issued by DRS, DRS will instruct the General/Prime Contractor holding back the 5% to release the withheld amount to the Nonresident Subcontractor. If the “Certificate of Compliance” is denied or not requested within **90 days of the completion date of the contract**, the General/Prime Contractor holding back the 5% will remit the withheld amount on their own Sales & Use tax returns.
- 2.2.4** The 5% holdback does not take the place of any tax returns due from the Unverified Nonresident Contractor.
- 2.2.5** The General/Prime Contractor must give the Unverified Nonresident Subcontractor written notice of the hold-back requirements by the time the Subcontractor begins work under the contract.

\*Document(s) must be submitted to the DAS/CS Office of Legal Affairs, Policy, and Procurement as specified in Section 00 41 00 “Bid Proposal Form”.

End of Section

**00 92 30 Procedures Regarding Taxation  
For Nonresident General/Prime Contractor & Subcontractors**

**01 10 00 SUMMARY**

A. **Summary:** Section 01 10 00 Summary contains the following Subsections:

01 11 00	Summary of Work	Not Used <input type="checkbox"/>
01 11 13	Work Covered By Contract Documents	Not Used <input type="checkbox"/>
01 12 16	Work Sequence - Phase(s);	Not Used <input type="checkbox"/>
01 12 19	Contract Interface	Not Used <input type="checkbox"/>
01 14 00	Work Restrictions	Not Used <input type="checkbox"/>
01 14 16	Coordination With Occupants	Not Used <input type="checkbox"/>
01 14 23	Subcontractor Evaluations	Not Used <input type="checkbox"/>

**01 11 00 SUMMARY OF WORK**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Project Number:** *BI-N-341.*
- C. **Project Title:** *COOLING TOWER REPLACEMENT.*  
It is to be completed and ready for use by the Owner and Agency within the Contract Time specified in Division 00, Section 00 11 16 "Invitation To Bid".
- D. **Project Location:** The cooling tower to be replaced sits atop the existing building located at 1111 Country club Road, Middletown, Connecticut.
- E. **The Project Description:** Replacement of an existing 350 ton cooling tower on top of an existing building.
1. The Authority Having Jurisdiction for a Project that **does not Exceed** the Threshold limitations and is not a CSUS 2020 Project, as defined by the Connecticut General Statutes, is the CT DAS / DCS Code Unit.

**01 11 13 WORK COVERED BY CONTRACT DOCUMENTS**

- A. **Related Documents:** Drawings and general provisions of the Contract, Specification Sections, apply to this Section.
- B. The Work includes but is not limited to the following:
1. ***Complete replacement of an existing cooling tower.***
  2. ***Removal of an existing cooling tower, piping, power, and controls.***
  3. ***Modification of existing structural framing and the addition of new structural framing to support a new cooling tower.***
  4. ***Removal of piping and installation of new piping required for the cooling tower.***
  5. ***Removal of electrical power and installation of new power for the cooling tower.***
  6. ***Removal of controls and the installation of new controls for the cooling tower.***
  7. ***Installation of new cooling tower including all piping, power, control, and support.***

8. ***Installation of new cooling tower drain routed through/in third floor ceiling to existing sanitary stack.***
  9. ***Installation of new DDC temperature control system from third floor closet to new tower with interface to existing building control system, including program modifications of existing programmed control sequence and all power required for control system.***
  10. ***Installation of all power required for new tower and associated control extended from existing electrical distribution.***
- C. The Contractor will include in his bid, all items required in order to carry out the intent of the work as described, shown and implied in the Contract Documents.
- D. It shall be the Contractor's responsibility upon discovery to immediately notify the Construction Administrator (CA), 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.
- E. **The Work will be constructed under a single lump sum.**
- F. **Examination Of Site:**
1. It is not the intent of the Documents to show all existing conditions. All contractors are advised to visit and examine the site with the Construction Administrator prior to submitting bids.
  2. Contractors should investigate and satisfy themselves 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. **Pre-Bid Conference:**
    - 4.1 A Pre-Bid Conference and tour of the site will be conducted as scheduled in Division 00 Section 00 11 16 "Invitation to Bid". This scheduled conference is the only official opportunity for the bidders to tour the site with the Owner, Architect, Engineer, Construction Administrator, and Agency.
- G. **Project Documents:**
1. The Specifications and Drawings are intended to describe and illustrate the materials and labor necessary for the work of this Project.
- H. The General Contractor will be given **10** sets of the Contract Documents on or about the time of execution of Contract, free of charge. If additional copies are wanted, they will be available at the direct additional cost of their reproduction, to the contractor.
- I. The Contractor shall receive **one (1)** set of AutoCAD compatible (latest version) Floor Plans on disks 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 disks from the Architect at the cost of their reproduction, to the contractor.

**01 12 16 WORK SEQUENCE - PHASE(S)**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. The entire Project shall be constructed in **a single** Phase. Work shall be substantially complete, ready for occupancy within **120** Calendar Days of commencement of the Work (the "**Contract Time**").

**01 12 19 CONTRACT INTERFACE**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Owner:** The Owner is the State of Connecticut, Department of Administrative Services.
  - 1. The authorized representative for the Owner is **Ashour Gevargisnia**, DCS Project Manager. The DCS Project Manager is located at Suite N1 2023, 450 Columbus Boulevard, Hartford, CT, 06103. Phone: **860-713-5639**; Fax: **860-622-2947**; E-mail: **Ashour.Gevargisnia@ct.gov**.
  - 2. The DCS Project Manager is the 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.
- C. **Agency:** The Connecticut State (User) Agency is **State Of Connecticut Department of Emergency Services & Public Protection Division of State Police**.
  - 1. The Agency Representative is **Robert Cody**. The Agency Representative's title is **Director of Facilities Operations**. The Agency Representative is located at **1111 Country Club Road, Middletown,** Connecticut, **06457**. Phone: **(860) 685-8935**; E-mail: **Robert.Cody@ct.gov**.
  - 2. 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.
- D. **Engineer:** The Engineering Firm is **BVH Integrated Services, PC**, and is located at **50 Griffin Road South, Bloomfield, CT 06002**. The Engineer representing the firm for this project is **Keith Barton**. Phone: **860-286-9171**; Fax: **860-242-0236**; E-mail: **keithb@bvhis.com**.
  - 1. The Engineer 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:
    - 1.1 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.
    - 1.2 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 "General Conditions", and the "Supplementary Conditions".

- 1.3 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.

**E. Construction Administrator:** The Construction Administrator is **Construction Solution Group, LLC, Mr. James Giuliano**, and is located at PO Box 271860, West Hartford, CT 06127. Phone: **860-306-7134**; E-mail: **jimg@csgroup-llc.com**.

1. The Construction Administrator is referred to in the Contract Documents as "Construction Administrator" or "Construction Manager" or by pronouns which imply it. All communications concerning the project will be directed through the Construction Administrator or a designated representative(s).
2. As information to the Contractor, the Construction Administrator's status is defined as follows:
  - 2.1 The Construction Administrator is the Owner's Agent who will, among other things, monitor the General Contractor's performance, scheduling and construction, process shop drawings, material, and equipment submittals, review and process periodic billings, review and recommend cost changes.
  - 2.2 The Construction Administrator will process all requests for information, interpretations and decisions regarding the meaning and intent of the Contract Documents, consulting with appropriate parties prior to rendering the interpretations or decisions to the Contractor. All such requests and replies shall be in writing.

**F. PMWeb Project Management:**

1. DCS is using PMWeb as the project management collaborative software tool for this project.
2. The General Contractor is required to utilize PMWeb for the duration of this project and shall provide all project information via this program management software. This includes, but is not limited to contracts, applications for payment, change orders, change order proposals, requests for information, etc.
3. The DCS Project Manager [or the Construction Administrator (CA)] shall arrange for training. This training is for the General Contractor's Staff, the DCS Project Manager, the Construction Administrator, the A/E, and their representatives.
4. DCS will be establishing a project specific email "file" address for this project. The General Contractor shall send an electronic "file" copy of all project documents to this email address, to include but not limited to all project correspondence, project emails, forms, etc.
5. The General Contractor is required to scan all documents that contain wet (ink) signatures and send a copy of those documents electronically to the DCS Project Manager and the project specific email "file" address. The hard copy of the wet signature documents shall be transmitted as directed by the DCS Project Manager. This includes, but is not limited to all contracts, change orders, applications for payment, closeout documentation, etc.

**01 14 00 WORK RESTRICTIONS**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. The Contractor shall confine his operations, including storage of apparatus, equipment and materials to the contract limit lines as directed by the Construction Administrator.
- C. The areas and/or spaces, including their access, shall be maintained free and clear throughout the contract term.
- D. Parking for Contractor's employees will be limited to an area (or areas) designated by the Construction Administrator. The Contractor may be required to provide identification stickers for employees' cars.

**01 14 16 COORDINATION WITH OCCUPANTS**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Full Agency Occupancy During Construction:** The Agency will occupy the site and existing building during the entire construction period. Cooperate with the Agency during construction operations to minimize conflicts and facilitate Owner 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. The Contractor will be responsible to maintain and protect egress ways during the construction sequence per the design as supplied by the Architect. Contractor shall be responsible for preparing egress plans for Owner approval and for Office of State Building Official and Office of State Fire Marshal for approval if required.
- D. **Agency Occupancy:**
  - 1. The DCS Project Manager will request a signed "Certificate of Compliance" from the Architect and Contractor, and forward the Certificate to the State Building Inspector for a Certificate of Occupancy and obtain the same after his review and approval.

**01 14 23 SUBCONTRACTOR EVALUATIONS:**

- A. Pursuant to C.G.S. Sec. 4a-101, the General 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 General Contractor shall complete and submit to the DCS evaluations of each such subcontractor upon fifty percent (50%) completion of the project and upon Substantial Completion of the project. The General 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 General Contractor. The General Contractor agrees to indemnify and hold the State harmless from any loss, damage, or expense that results from or is caused by the General Contractor's failure to complete and submit the evaluations to DCS in accordance with this provision.

**End**  
**Section 01 10 00 Summary**

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**01 20 00 CONTRACT CONSIDERATIONS**

**A. Summary:** Section 01 20 00 Contract Considerations contains the following subsections:

01 21 00	Allowances	Not Used <input checked="" type="checkbox"/>
01 22 00	Unit Prices - General	Not Used <input checked="" type="checkbox"/>
01 22 13	Unit Price Schedules - Earth And Rock Excavation	Not Used <input checked="" type="checkbox"/>
01 22 16	Unit Price Schedule - Miscellaneous	Not Used <input checked="" type="checkbox"/>
01 22 19	Unit Price Schedule – Alterations	Not Used <input checked="" type="checkbox"/>
01 23 00	Supplemental Bids	Not Used <input type="checkbox"/>
01 25 00	Substitution Procedures	Not Used <input type="checkbox"/>
01 26 00	Contract Modification Procedures	Not Used <input type="checkbox"/>
01 29 76	Progress Payment Procedures	Not Used <input type="checkbox"/>

**01 21 00 ALLOWANCES (Not Used)**

**01 22 00 UNIT PRICES – GENERAL (Not Used)**

**01 22 13 UNIT PRICE SCHEDULES - EARTH AND ROCK EXCAVATION (Not Used)**

**01 22 16 UNIT PRICE SCHEDULE - MISCELLANEOUS (Not Used)**

**01 22 19 UNIT PRICE SCHEDULE - ALTERATIONS (Not Used)**

**01 23 00 SUPPLEMENTAL BIDS**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Definition:** A Supplemental Bid is an amount proposed by bidders and stated on the Bid Proposal Form for certain work defined in the Bidding Documents that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
- The cost for each supplemental bid is the net addition to the Contract Sum to incorporate the Supplemental Bid into the Work. Supplemental Bids are only accepted in the numerical order that they are listed on the Bid Proposal Form and never accepted out of numerical sequence. No other adjustments are made to the Contract Sum.

**C. Procedures:**

1. **Coordination:** Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.
  - 1.1 Include as part of each Supplemental Bid, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Supplemental Bid.
  - 1.2 Execute accepted Supplemental Bids under the same conditions as other Work of this Contract.
  - 1.3 Schedule: A "Schedule of Supplemental Bids" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each Supplemental Bid.

**D. Schedule of Supplemental Bids:**

1. ***Supplemental Bid No. 1: ADD cost to provide a stainless steel basin/lower casing in lieu of galvanized steel basin/lower casing for the cooling tower per Specification Section 23 65 00 Cooling Towers.***
2. ***Supplemental Bid No 2: Add cost to provide Cooling Tower Water Treatment System per Section 232500 HVAC Water Treatment. Include in Base Bid initial cleaning/flushing of new piping system and initial water quality testing /report with recommendations for required treatment systems.***

**01 25 00 SUBSTITUTION PROCEDURES**

**A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**B. Summary**

1. This Section includes administrative and procedural requirements for handling requests for equals and substitutions made after award of the Contract.
2. Related Sections: The following Sections contain requirements that relate to this Section:
  - 2.1 Division 01 Section 01 33 00 "Submittal Procedures" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.
  - 2.2 Division 01 Section 01 42 19 "Reference Standards" specifies the applicability of industry standards to products specified.
  - 2.3 Division 01 Section 01 60 00 "Product Requirements" specifies requirements governing the Contractor's selection of products and product options.

**C. Definitions**

1. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
2. **Equals or Substitutions General:** Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract.

**D. Submittals**

1. **Equals and Substitution Request Submittals:** The Owner will consider requests for equals or substitutions if made prior to the Receipt of the Competitive Bid. The information on all materials shall be consistent with the information herein. After the contract award, substitutions will be considered for materials or systems specified that are no longer available. It will not be considered if the product was not purchased in a reasonable time after award. The Contractor shall submit all equal and substitutions requests on the **"Equal or Substitute Product Request"** Form, an example is shown at the end of this Section and the Form is available from the Construction Representative (CA). See Article 15 in the General Conditions for further refinement and information.
  - 1.1 The Contractor is required to prepare and submit three (3) copies of the required data for the first manufacturer listed or procedure listed in the specifications section with reference to all of the following areas: the substance and function considering quality, workmanship, economy of operation, durability and suitability for purposes intended including the size, rating and cost. All submissions must include all the required data for the first listed manufacturer or procedure as specified, as well as the required data for the proposed Equal or Substitution. This will enable the Owner and Engineer to determine that the proposed Equal or Substitution is or is not substantially equal to the first listed manufacturer or procedure.
  2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
  3. Provide complete documentation showing compliance with the requirements for equals or substitutions, and the following information, as appropriate:
    - 3.1 Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed Equal or Substitution.
    - 3.2 A detailed comparison chart of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
    - 3.3 Product Data, including Shop Drawings and descriptions of products and fabrication and installation procedures.
    - 3.4 Samples, where applicable or requested.
    - 3.5 A statement indicating the effect on the Contractor's Construction Schedule compared to the schedule without approval of the Equal or Substitution. Indicate the effect on overall Contract Time.
    - 3.6 Cost information, broken down, including a proposal of the net change, if any in the Contract Sum.
    - 3.7 The Contractor's certification that the proposed Equal or Substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
    - 2.8 The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the Equal or Substitution to perform adequately.

4. **Engineer's Action:** If necessary, the Engineer will request additional information or documentation for evaluation within **seven (7)** Calendar Days of receipt of the original request for equal or substitution request. The Engineer will notify the Construction Administrator who will notify the Owner of recommended acceptance or rejection of the proposed equal or substitution, within **fourteen (14)** Calendar Days of receipt of the request, or **seven (7)** Calendar Days of receipt of additional information or documentation, whichever is later. The Construction Administrator will give final acceptance or rejection by the Owner not less than **seven (7)** Calendar Days after notification.
- 1.1 Any request deemed an "Equal" and accepted by the Construction Administrator, Engineer, Owner, and Agency will result in written notification to the Contractor and will not be in the form of a change order for an "Equal".
- 1.2 Any request deemed a "Substitution" and rejected or approved by Construction Administrator, Engineer, and Owner may result in written notification to the Contractor and may be in the form of a Change Order if the "Substitution" is approved.

**E. Equal Or Substitutions**

1. **Conditions:** The Engineer will consider the Contractor's request for Equal or Substitution of a product or method of construction when one or more of the following conditions are satisfied, as determined by the Engineer. If the following conditions are not satisfied, the Engineer will return the requests to the Construction Administrator without action except to record noncompliance with these requirements.
- 1.1 The proposed request does not require extensive revisions to the Contract Documents.
- 1.2 The proposed request is in accordance with the general intent of the Contract Documents.
- 1.3 The proposed request is timely, fully documented, and/or properly submitted.
- 1.4 The proposed request can be provided within the Contract Time. However, the Engineer will not consider the proposed request if it is a result of the Contractor's failure to pursue the Work promptly or coordinate activities properly.
- 1.5 The proposed request will offer the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. However, if the proposed request requires the Owner to incur additional responsibilities, including but not limited to, additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or similar considerations, then the Owner will have just cause to reject the request for Equal or Substitution.
- 1.6 The proposed request can receive the necessary approvals, in a timely manner, required by governing authorities having jurisdiction.
- 1.7 The proposed request can be provided in a manner that is compatible with the Work as certified by the Contractor.
- 1.8 The proposed request can be coordinated with the Work as certified by the Contractor.

- 1.9 The proposed request can uphold the warranties required by the Contract Documents as certified by the Contractor.
2. The Contractor's submission and the Engineer's review of Submittals, including but not limited to, Samples, Manufacturer's Data, Shop Drawings, or other such items, which are not clearly identified as a request for an Equal or Substitution, will not be considered or accepted as a valid request for an Equal or Substitution, nor does it constitute an approval.
3. **Equal or Substitution Produce Request Form** (Example):



7001  
**Equal or Substitute  
 Product Request**

Page 1 of 1

Request Phase Pre-Bid  Post Bid  (See Article 15 Materials: Standards, General Conditions)  
 (If Pre-bid only) Current Bid Due Date: \_\_\_\_\_ Request No.: \_\_\_\_\_ Dated: \_\_\_\_\_  
 To: State of Connecticut DCS Project No.: \_\_\_\_\_  
 Department of Administrative Services Project Name / Location: \_\_\_\_\_  
 Division of Construction Services

<b>References:</b>	Specification(s): _____	Section(s): _____	Paragraph(s): _____
	Drawing(s): _____	Drawing(s) No(s): _____	Detail(s) No(s): _____
<b>Contractually Specified Product:</b> _____			
<b>Contractor Proposed Product:</b> _____			
<b>Proposed Product is:</b> Equal: <input type="checkbox"/> Substitute: <input type="checkbox"/> Model No.: _____			
<i>See attached data for both specified and proposed products as required by Article 15 General Conditions.</i>			
<b>Data attached:</b>	Drawings: <input type="checkbox"/>	Product Data: <input type="checkbox"/>	Reports: <input type="checkbox"/> Samples: <input type="checkbox"/>
	Tests: <input type="checkbox"/>	Other: _____	
<b>Reason(s) for not providing the Specified Product:</b> _____			
<b>Similar Installation:</b>			
Project:	Architect:		
Address:	Owner:		
	Date Installed:		

Will proposed substitution impact other parts of the Work?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	<i>If yes attach explanation.</i>
Will proposed substitution increase Contract Time?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	<i>by number of Days</i> _____
<b>Actual Dollar Savings to the State of Connecticut if substitution is accepted:</b> \$ _____			
The Undersigned Certifies that the proposed Request for an Equal or Substitute Product conforms to all of the requirements of Division 01 General Requirements, Section 01 25 00 Substitution Procedures.			
<b>Request Submitted By General Contractor / CMR:</b> _____ <small>(Firm's Typed Name)</small>			
<b>By:</b> _____	_____	_____	_____
<small>(Typed Name)</small>	<small>(Title)</small>	<small>(Signature)</small>	<small>(Date)</small>
<b>CONTRACTOR / CMR Send copies to</b> DCS PM: <input type="checkbox"/> CA: <input type="checkbox"/>			

<b>Consultant's Review – This Substitution Request is:</b>		Request Received on (Date): _____
<input type="checkbox"/> Approved:	<i>(Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)</i>	
<input type="checkbox"/> Approved as Noted:	<i>(Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)</i>	
<input type="checkbox"/> Rejected:	<b>Use Specified Materials.</b>	
<input type="checkbox"/> Rejected:	<b>Request Not Received Within Specified Time Period - Use Specified Materials.</b>	
<b>Reviewed Issued By:</b> _____		
	<small>(Typed Name)</small>	<small>(Signature)</small>
		<small>(Date)</small>
<b>CONSULTANT Send copies to:</b> DCS PM: <input type="checkbox"/> CA: <input type="checkbox"/> Chief Architect <input type="checkbox"/> Chief Engineer <input type="checkbox"/>		

If Approved: As noted by Consultant,  
 DCS Chief Architect: \_\_\_\_\_  
(Signature) (Date)  
 Copies: Project File Red R2

**01 26 00 CONTRACT MODIFICATION PROCEDURES**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Summary**
1. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
- C. Related Sections:** The following Sections contain requirements that relate to this Section:
1. Division 01 Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after award of the Contract.
  2. Division 01 Section 01 29 76 "Progress Payment Procedures" for administrative procedures governing Applications for Payment.
  3. Division 01 Section 01 32 16 "Construction Progress Schedules" for requirements for construction scheduling and reporting progress of work.
  4. Division 01 Section 01 33 00 "Submittal Procedures" for requirements for submittal of the Construction Progress Schedule.
  5. Division 00 General Requirements "Article 13" "Change Orders".
- D. Requests For Information**
1. In the event that the Contractor or subcontractor, at any tier, determines that some portion of the drawings, specifications, or other contract documents requires clarification or interpretation by the Engineer, the Contractor shall submit a "Request for Information" in writing to the Engineer via the Construction Administrator. "Requests for Information" may only be submitted by the Contractor and shall only be submitted on the "Request for Information" forms as required by the Owner.
    - 1.1 In the "Request for Information", the Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed from the Engineer.
    - 1.2 In the "Request for Information", the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
    - 1.3 The Owner acknowledges that this is a complex project. Based upon the owner's past experience with projects of similar complexity, the Owner anticipates that there will probably be some "Requests for Information" on this project.
    - 1.4 The Engineer will review all "Requests for Information" to determine whether they are valid "Requests for Information". If it is determined that the document is not a valid "Request for Information", it will be returned to the Contractor, unreviewed as to content, for resubmittal on the proper form and in the proper manner.
    - 1.5 A "Requests for Information Response" shall be issued within **seven (7)** Calendar Days of receipt of the request from the Contractor unless the Owner determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Owner, the Owner will, within **seven (7)** Calendar Days of receipt of the request, notify the Contractor of the anticipated

response time. If the Contractor submits a "Request for Information" on an activity with **seven (7)** Calendar Days or less of float on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Engineer to respond to the request provided that the Engineer responds within the **seven (7)** Calendar Days set forth above.

- 1.6** A "Request for Information Response" from Engineer will not change any requirement of the Contract Documents. In the event the Contractor believes that the "Request for Information Response" will cause a change to the requirements of the Contract Documents, the Contractor shall within **seven (7)** Calendar Days give written notice to the Construction Administrator stating that the Contractor believes the "Request for Information Response" will result in a "Change Order" and the Contractor intends to submit a "Change Order Proposal" request. Failure to give such written notice **seven (7)** Calendar Days shall waive the Contractor's right to seek additional time or cost under the requirement these Requirements.

**E. Minor Changes In The Work**

- 1.** The Engineer, through the Construction Administrator, will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on the "Supplemental Instructions" form as required by the Owner.

**F. Proposal Request**

- 1. Engineer/Owner-Initiated Requests For Proposals:** The Engineer or Owner will issue a detailed description of proposed changes in the Work via the Construction Administrator that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications. Such requests shall be on a "Proposal Request" form as required by the Owner.

- 1.1** "Proposal Request" is issued for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.

**1.1.1** Within **fourteen (14)** Calendar Days of receipt of a "Proposal Request", submit a "Change Order Proposal" with the required information necessary to execute the change to the Construction Administrator for the Engineer's/Owner's review.

**1.1.2** Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

**1.1.3** Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.

**1.1.4** Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

**1.1.5** The Agency is tax exempt. All Contractor and Subcontractor services provided under your Contract with the State of Connecticut may not be exempt from taxes. The Department of Revenue Services can guide you as to which services are exempt and which are not. Please contact the



State of Connecticut, Department of Revenue Services at 1-800-382-9463 or 860-541-3280.

- 1.1.6** Dollar values shown on the Schedule of Values shall not be the governing (or deciding) final amounts for change orders involving either additional charges or deletions.

**G. Change Order Proposal:**

1. When either a "Request for Information" from the Contractor or a "Proposal Request" from the Engineer or Owner results in conditions that may require modifications to the Contract, the Contractor may propose changes by submitting a request for a "Change Order Proposal" to the Engineer via the Construction Administrator on forms as required by the Owner. These forms shall also include "Change Order Proposal Worksheets" as required by the Owner.
  - 1.1 Include statements outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
  - 1.2 Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities as directed by Article 13 of the General Conditions of the Contract for Construction.
  - 1.3 Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
  - 1.4 Comply with requirements in Division 01 Section 01 25 00 "Substitution Procedures" if the proposed change requires an equal or substitution of one product or system for a product or system specified.
  - 1.5 The State of Connecticut construction contract has the following tax exemptions:
    - 1.5.1 Purchasing of materials which will be physically incorporated and become a permanent part of the project.
    - 1.5.2 Tools, supplies and equipment used in fulfilling the construction contract are not exempt.
    - 1.5.3 Services that are resold by the contractor are exempt, i.e. if a General Contractor hires a plumber, carpenter or electrician, a resale certificate may be issued to the subcontractor because these services are considered to be integral and inseparable component parts of the building contract.
2. **"Change Order Request" Forms:** Use "Change Order Proposal" and "Change Order Proposal Worksheets" forms as required by Owner.
3. A "Change Order Proposal" cannot be submitted without either prior submission of a "Request for Information" from the Contractor or as a response to a "Proposal Request" submitted by the Engineer or Owner.
4. Any "Change Order Request" submitted without a prior submittal of a "Request for Information" or as a response to a "Proposal Request" will be immediately rejected and returned to the Contractor.

**H. Construction Change Directive:**

1. **"Construction Change Directive":** When the Owner and the Contractor disagree on the terms of a "Change Order Proposal" resulting from either a "Request for Information" or "Proposal Request", then the Engineer through the Construction Administrator may issue a "Construction Change Directive" on a "Construction Change Directive" form as authorized by the Owner. The "Construction Change Directive" instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a "Change Order".
  - 1.1 The "Construction Change Directive" contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.
  - 1.2 Contractor must proceed with the Work once a "Construction Change Directive" is issued.
  - 1.3 The change in the Contract Sum and Contract Time resulting from the issuance of a "Construction Change Directive" will be based on "Time & Material" or "Unit Prices".
  - 1.4 Issuance of "Construction Change Directive" does not guarantee payment for the Work described in the "Construction Change Directive".
2. **Documentation:** The Contractor shall maintain detailed records on a time and material basis of work required by the "Construction Change Directive".
  - 2.1 After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
  - 2.2 The final value shall be negotiated based on the supporting data to determine the value of the work.
3. **Change Order Procedures:**
  - 3.1 Upon the Owner's approval of a Contractor's "Change Order Proposal", the Construction Administrator will issue a "Change Order" for signatures of the Engineer, Owner and the Contractor on a "Change Order" form as required by the Owner.

**01 29 76 PROGRESS PAYMENT PROCEDURES**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Summary:**
  1. This Section specifies procedures for preparation and submittal of the Contractor's Applications for Payment.
  2. **Related Sections:** The following Sections contain requirements that relate to this Section.
    - 2.1 **Division 00 Notice to Bidders:** Article 10.
    - 2.2 **General Conditions:** Articles: 27 "Schedule of Values, Application for Payment"; 28 "Partial Payments"; 31 "Final Payment"; and 32 "Owner's Right to Withhold Payments".

- 2.3 Division 01 Section 01 32 16 "Construction Progress Schedules" for requirements for construction scheduling and reporting progress of work.
- 2.4 Division 01 Section 01 33 00 "Submittal Procedures".
- 2.5 Division 01 Section 01 77 00 "Closeout Procedures" for requirements for Final Payment.

**C. Schedule Of Values:**

- 1. **Coordination:** Coordinate preparation of the "Schedule of Values" with preparation of the Construction Schedule. Use "Schedule of Values" form as required by the Owner.
  - 1.1 Submit the "Schedule of Values" to the Construction Administrator at the earliest possible date but no later than **twenty-one (21)** Calendar Days after Contract Start Date.
- 2. **Format and Content:** Use the Project Manual Table of Contents as a guide to establish the format for the "Schedule of Values". Provide at least one line item for each Specification Section on electronic media printout.
  - 2.1 Identification: Project identification on the Schedule of Values shall include, but not be limited to, the following:
    - 2.1.1 **Owner;**
    - 2.1.2 **Project Number;**
    - 2.1.3 **Project Name;**
    - 2.1.4 **Project Location;**
    - 2.1.5 **Contractor's name and address.**
  - 2.2 Arrange the "Schedule of Values" in tabular format as required by the Owner, containing separate columns including, but not limited to, the following Items:
    - 2.2.1 **Item Number;**
    - 2.2.2 **Description of Work with Related Specification Section or Division Number;**
    - 2.2.3 **Scheduled Values broken down by description number, type material, units of each material.**
      - .1 **Include break down of General Condition requirements, i.e. bonds, insurance premiums, taxes, job mobilization, temporary facilities, field supervision and layout, operation and maintenance manuals, punch list activities, project record documents, demonstration and training, overhead, and profit as separate line items.**
      - .2 **Identify material cost and labor cost as separate line items for each.**
    - 2.2.4 **Name of subcontractor;**
    - 2.2.5 **Name of manufacturer or fabricator;**
    - 2.2.6 **Name of supplier;**
    - 2.2.7 **Retainage;**

**2.2.8 Contract sum in sufficient detail.**

3. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual Table of Contents. Break principal subcontract amounts down into several line items. In addition, the following items listed below must be included.
  - 4.1 Project Coordination (01 31 13): a lump sum of this cost for payment at the submittal of this product a minimum cost of 1/10<sup>th</sup> of one percent of the base bid total project cost or \$5,000 whichever is greater.
  - 4.2 Photographic Documentation (01 32 33): a monthly cost of \$100 per month to be paid each month upon receipt of the photographs or forfeit of that month's payment.
  - 4.3 Submittal Procedures (01 33 00): a lump sum payment calculated at 1/20<sup>th</sup> of 1% of the base bid total project cost upon receipt of the schedule.
  - 4.4 As-Built Updates (01 31 00) a monthly cost, a minimum payment of \$1,000 with forfeit of that monthly payment if not done.
  - 4.5 Progress Cleaning (01 74 13): a monthly cost. A minimum payment of \$1,000 to \$3,000 (based on size & complexity of the project) with forfeit of that monthly payment if not done.
  - 4.6 Starting and Adjusting (01 75 00): a lump sum cost upon completion. (to be determined by DCS Project Manager with Engineer & Construction Administrator advice).
  - 4.7 Construction Progress Schedules (01 32 16): For the Base Schedule a lump sum payment or 40% of the total schedule budget, with the remainder paid on an even payment over the duration of the project.
5. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
6. **General Conditions:** Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
  - 6.1 Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.

**D. Applications For Payment:**

1. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and Construction Administrator and paid for by the Owner.
  - 1.1 The initial "Application for Payment", the "Application for Payment" at time of "Substantial Completion", and the final "Application for Payment", involve additional requirements.

2. **Payment-Application Terms:** The Owner will process monthly progress payments. The Contractor may submit applications for payment on a monthly basis.
  3. **Payment-Application Forms:** Use the "Application for Payment" form as required by the Owner. Present the required information on electronic media printout or Owner approved form; multiple pages should be used if required.
    - 3.1 For each item, provide a column including but not limited to the following items:
    - 3.2 Item Number.
    - 3.3 Description of Work and Related Specification Section or Division.
    - 3.4 Scheduled Value, break down by units of material and units of labor.
    - 3.5 Work Completed from previous application.
    - 3.6 Work Completed this period.
      - 3.6.1 Materials presently stored.
      - 3.6.2 Total Completed and stored to date of application.
      - 3.6.3 Percentage of Completion.
      - 3.6.4 Balance to Finish.
      - 3.6.5 Retainage.
- E. **Application Preparation:** Complete every entry on the Application form. At the time of Final Payment only, include an executed Application form by a person authorized to sign legal documents on behalf of the Contractor. The Construction Administrator will return incomplete Applications without action.
1. Entries shall match data on the "Schedule of Values".
  2. Include amounts of Change Orders issued prior to the last day of the construction period covered by the application.
- F. **Transmittal:** Except for final payment, submit to the Construction Administrator by a method ensuring receipt within **forty-eight (48)** hours. **One (1)** complete, signed and notarized original of each Application for Payment, including lien waivers and similar attachments when required, along with **six (6)** copies. For Final Payment, **nine (9)** complete, signed and notarized copies shall be submitted.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Engineer.
- G. **Applications for Payment:** Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment and all subsequent Application for Payments including, but not limited to, the following items:
1. **Subcontractor Evaluations:**

Pursuant to C.G.S. Sec. 4a-101, the General 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 General Contractor shall complete and submit to the DCS evaluations of each such subcontractor **upon fifty percent (50%) completion of the project and upon Substantial Completion of the project**. The General 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

General Contractor. The General Contractor agrees to indemnify and hold the State harmless from any loss, damage, or expense that results from or is caused by the General Contractor's failure to complete and submit the evaluations to DCS in accordance with this provision.

2. List of subcontractors and suppliers' name, FEIN/Social Security numbers, and Connecticut Tax Registration Numbers;
3. List of principal suppliers and fabricators;
4. Schedule of Values;
5. Contractor's Construction Schedule (preliminary if not final);
6. Schedule of principal products;
7. Submittal Schedule (preliminary if not final);
8. List of Contractor's staff assignments;
9. List of Contractor's principal consultants;
10. Copies of all applicable permits;
11. Copies of authorizations and licenses from governing authorities for performance of the Work;
12. Proof that subcontractors have been paid amounts included on the Contractor's Application for Payment within thirty (30) days after the Owner has paid the Contractor for the particular Application for Payment in accordance with Connecticut General Statute § 49-41a (a)(1).
13. Releases of Lien from subcontractors with amounts included on the Contractor's Application for Payment when Contractor has been paid by the Owner for the particular Application for Payment but the subcontractors have not been paid.
14. Proof that as-built documents are updated as required by Section 01 77 00 "Closeout Procedures."
15. Initial as-built survey and damage report, if required.
16. Update the "Contractor's Master Subcontract Agreement List" and submit copies all recently executed Subcontract Agreements in accordance with CGS § 4b-96.
  - 16.1 The "Contractor's Master Subcontract Agreement List" shall list all Subcontract Agreements in order of Contract Sum magnitude (from high to low) in the following format:

<b>Contractor's Master Subcontract Agreement List</b>				
<b>Subcontractor Name</b>	<b>Minority Or Small Business Designation</b>	<b>Trade</b>	<b>Address</b>	<b>Contract Sum</b>

17. In accordance with 42-158j (b):  
 Each payment requisition submitted shall include a statement showing the status of all pending construction change orders, other pending change directives and approved changes to the original contract or subcontract. Such statement shall identify the pending construction change orders and other pending change directives, and shall include the date such change

orders and directives were initiated, the costs associated with their performance and a description of any work completed. As used in this section, "pending construction change order" or "other pending change directive" **means an authorized directive for extra work that has been issued to a contractor or a subcontractor and identified by an official Change Order Number or Construction Change Directive Number assigned by the State of Connecticut.**

**H. Application for Payment at Substantial Completion:** Following issuance of the Certificate of Substantial Completion submit an Application for Payment form; use the form as required by the Owner. Present the required information on electronic media printout as applicable that include, but are not limited, to the following:

**1. Subcontractor Evaluations:**

Pursuant to C.G.S. Sec. 4a-101, the General 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 General Contractor shall complete and submit to the DCS evaluations of each such subcontractor upon fifty percent (50%) completion of the project and upon Substantial Completion of the project.** The General 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 General Contractor. The General Contractor agrees to indemnify and hold the State harmless from any loss, damage, or expense that results from or is caused by the General Contractor's failure to complete and submit the evaluations to DCS in accordance with this provision.

**2.** This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

**3.** Administrative actions and submittals that shall precede or coincide with this application include, but are not limited to, the following:

**3.1 Warranties (guarantees) and maintenance agreements;**

**3.2 Test/adjust/balance records;**

**3.3 Maintenance instructions;**

**3.4 Meter readings;**

**3.5 Startup performance reports;**

**3.6 Changeover information related to Owner's occupancy, use, operation, and maintenance;**

**3.7 Final cleaning;**

**3.8 Application for reduction of retainage and consent of surety;**

**3.9 Advice on shifting insurance coverage;**

**3.10 Final progress photographs;**

**3.11 List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.**

**I. Final Payment Application:** Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include, but are not limited, to the following:

**1. Completion of Project Closeout requirements.**

2. ***Completion of list of items remaining to be completed as indicated on the attachment to the Certificate of Substantial Completion.***
3. ***Ensure that unsettled claims will be settled.***
4. ***Ensure that incomplete Work is not accepted and will be completed in accordance with a schedule prepared by the Contractor which is acceptable to the Owner.***
5. ***Transmittal of required Project construction records to the Owner (including as-built documents specified in Section 01 77 00 "Closeout Procedures").***
6. ***Proof that taxes, fees, and similar obligations were paid.***
7. ***Removal of temporary facilities and services.***
8. ***Removal of surplus materials, rubbish, and similar elements***
9. ***The requirements of the General Conditions and Supplementary Conditions for Final Acceptance, Final Completion, Final Inspection, and Final Payment.***
10. ***Asbestos, lead or other hazardous material manifests.(if applicable)***
11. ***Completion of "Contractor Reporting Form" as supplied by DCS, for all Contractors, Subcontractors, Vendors, Suppliers, etc. who work on the Contract. The form includes the following information:***
  - 13.1 ***Contractor/Subcontractor name.***
  - 13.2 ***FEIN/Social Security Numbers***
  - 13.3 ***Connecticut Tax Registration Numbers***
  - 13.4 ***Type of work***
  - 13.5 ***Name of business and address***
  - 13.6 ***Remittance address.***

**End**  
**Section 01 20 00**  
**Contract Considerations**



**01 30 00 ADMINISTRATIVE REQUIREMENTS**

- A. **Summary:** Section 01 30 00 Administrative Requirements contains the following Subsections:

<b>01 31 13</b>	<b>Project Coordination</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 31 19</b>	<b>Project Meetings</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 32 16</b>	<b>Construction Progress Schedules</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 32 33</b>	<b>Photographic Documentation</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 33 00</b>	<b>Submittal Procedures</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 35 16</b>	<b>Alteration Project Procedures</b>	<b>Not Used</b> <input type="checkbox"/>
<b>01 35 19</b>	<b>Confined Space Entry</b>	<b>Not Used</b> <input checked="" type="checkbox"/>
<b>01 35 53</b>	<b>Security Procedures</b>	<b>Not Used</b> <input type="checkbox"/>

**01 31 13 PROJECT COORDINATION**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Related Sections:** The following Sections contain requirements that relate to this section.
1. **Section 01 29 76 “Progress Payment Procedures”** submission of Schedule of Values and Applications for payment.
- C. **Construction Administrator:**
1. The Construction Administrator is identified in Division 01 **Section 01 12 19 “Contract Interface”**.
  2. **Construction Mobilization:**
    - 2.1 Cooperate with the Construction Administrator in the allocation of mobilization areas of the site, for field offices and sheds, for agency facility access, traffic, and parking facilities.
    - 2.2 During Construction, coordinate use of site and facilities through the Construction Administrator.
    - 2.3 Comply with Construction Administrators procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
    - 2.4 Comply with instructions of the Construction Administrator for use of temporary utilities and construction facilities.
    - 2.5 Coordinate field engineering layout as specified in Division 01 **Section 01 71 23 “Field Engineering”** for work under the instructions of the Construction Administrator.
- D. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
  3. Make provisions to accommodate items scheduled for later installation.
- E. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Construction Administrator, Owner and separate contractors where coordination of their work is required.
- F. **Administrative Procedures:** Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. ***Preparation of schedules.***
  2. ***Installation and removal of temporary facilities.***
  3. ***Delivery and processing of submittals.***
  4. ***Progress meetings.***
  5. ***Project closeout activities.***
- G. **General Coordination Provisions:**
1. **Inspection of Conditions:** Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed and coordinate such inspections with the Construction Administrator and authorities having jurisdictions. If unsatisfactory conditions exist notify the Construction Administrator immediately. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
  2. The Contractor shall coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
    - 2.1 **Coordination Drawings:**
      - 2.1.1 The HVAC Subcontractor will initiate AutoCAD Coordination drawings showing the cooling tower and all related piping to be installed.
      - 2.1.2 The Structural Steel Subcontractor will then create an AutoCAD drawing utilizing the information from the HVAC Coordination drawing showing all modifications required to support the new cooling tower and related piping.
      - 2.1.3 The Electrical subcontractor will superimpose all the electrical information onto the HVAC AutoCAD Coordination drawing. Said information to include but not necessary limited to equipment, lighting, conduits, etc.
      - 2.1.4 The control subcontractor will complete the coordination drawing by drawing his piping (include pitch) on the tracing.
      - 2.1.5 The Construction Administrator will review the completed coordination drawing for general compliance and then submit it to the Engineer for his review. All subcontractors shall rework the Mylar drawings until all systems are properly coordinated.

3. The Construction Administrator will meet with the Contractor on all major items of coordination.
4. See also **Division 00 General Conditions, Article 7 “Cooperation of Trades”**.

**01 31 19 PROJECT MEETINGS**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Pre-construction Conference:**
  1. The Contractor will attend a Pre-construction Conference before starting construction, as scheduled by the Construction Administrator convenient to the Owner, the Construction Administrator, Engineer, and Contractor. This meeting will take place within **fourteen (14)** Calendar Days after the written Notice to Proceed and before the Contract Start Date. Hold the conference at the Project Site or another convenient location as directed by the Construction Administrator. The Construction Administrator shall conduct the Pre-construction Conference to review the Contractor and Subcontractor responsibilities and personnel assignments.
  2. **Attendees:** Authorized representatives of the Construction Administrator, Owner, Engineer, and their consultants; the Contractor and its superintendent; major subcontractors; agency; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
  3. **Agenda:** Discuss items of significance that could affect progress, including the following:
    - 3.1 ***Tentative construction schedule;***
    - 3.2 ***Critical work sequencing;***
    - 3.3 ***Progress meeting schedule;***
    - 3.4 ***Designation of responsible personnel;***
    - 3.5 ***Procedures for processing field decisions and Change Orders;***
    - 3.6 ***Procedures for processing Applications for Payment;***
    - 3.7 ***Distribution of Contract Documents;***
    - 3.8 ***Submittal of Shop Drawings, Product Data, and Samples;***
    - 3.9 ***Preparation of record documents;***
    - 3.10 ***Use of the premises;***
    - 3.11 ***Parking availability;***
    - 3.12 ***Office, work, and storage areas;***
    - 3.13 ***Equipment deliveries and priorities;***
    - 3.14 ***Safety procedures;***
    - 3.15 ***First aid;***
    - 3.16 ***Security;***
    - 3.17 ***Housekeeping;***

**3.18 Working hours;**

**C. Progress Meetings:**

1. The Construction Administrator will conduct progress meetings, bi-weekly, at the Project Site or at regular intervals as agreed upon at the Pre-construction Conference. The Construction Administrator will notify the Owner, the Engineer, and the Contractor of the scheduled Progress Meeting dates. Coordinate dates of Progress Meetings with preparation of Application for Payment requests.
2. **Attendees:** In addition to representatives of the Contractor, Construction Administrator, Owner and the Engineer, subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities may be requested to attend these meetings on an as needed basis. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work. The Contractor shall include the site superintendent as a minimum.
3. **Agenda:** Progress Meetings shall review and correct or approve minutes of the previous Progress Meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
  - 3.1 **Construction Schedule:** Review progress since the last Progress Meeting. Determine where each activity is in relation to the required Contractor's "Construction Schedule" and whether each activity is on time or ahead or behind Schedule. Determine how Work that is behind Schedule will be expedited; secure commitments from parties involved to do so. Discuss whether Schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
  - 3.2 Review the present and future needs of each entity present
4. **Reporting:** The Construction Administrator will distribute minutes of the meeting to each party present, promptly and before the next scheduled meeting, and to parties who should have been present.
5. A schedule of regular Project Meetings will be established at the Pre-construction Conference.

**01 32 16 CONSTRUCTION PROGRESS SCHEDULES**

**A. Related Documents**

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

**B. Summary**

1. This Section includes administrative and procedural requirements for the preparation, submittal, and updating of the Contractor's construction schedules and reporting progress of the Work.
  - 1.1. Refer to the General Conditions and the Agreement for definitions and specific dates of Contract Time.
2. This Section includes the following:
  - 2.1. Format.
  - 2.2. Content.

- 2.3. Revisions to schedules.
- 2.4. Submittals.
- 2.5. Distribution.
- 3. **Related Sections:** The following Sections contain requirements that relate to this Section:
  - 3.1 Division 01 Section 01 29 76 "Progress Payment Procedures" specifies requirements for submitting Schedule of Values and Application for Payments.
  - 3.2 Division 01 Section 01 31 19 "Project Meetings" specifies requirements for submitting and distributing meeting and conference minutes.
  - 3.3 Division 01 Section 01 33 00 "Submittal Procedures" specifies requirements for submitting the Submittal Schedule.
  - 3.4 Division 01 Section 01 45 00 "Quality Control" specifies requirements for submitting inspection and test reports.
  - 3.5 Division 01 Section 01 60 00 "Product Requirements" specifies requirements for submitting the list of products.
- C. **Definitions**
  - 1. **Construction Schedule:** A method of planning and scheduling a construction project utilizing 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.
- D. **Quality Assurance**
  - 1. **The Contractor's Consultant:** Retain a consultant to provide planning, evaluating, and reporting by CPM scheduling.
    - 1.1. **In-House Option:** The Owner may waive the requirement to retain a consultant if the Contractor can demonstrate that:
      - 1.1.1. The Contractor has the computer equipment required to produce construction schedules.
      - 1.1.2. The Contractor employs skilled personnel with experience in construction scheduling and reporting techniques.
    - 1.2. **Program:** Use **Microsoft Project** latest version.
    - 1.3. **Standards:** Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- E. **Preliminary Schedule**
  - 1. Preliminary Gantt schedule is to be prepared by the General Contractor and submitted to the Construction Administrator within **seven (7)** days of award of contract. This schedule is to cover all items of Work from the start of the project up to the completion of the project. This schedule must be revised when the actual schedule of significant items varies more than one week from the proposed schedule.
- F. **Construction Schedule Format**
  - 1. **Format:** Utilize a horizontal bar chart (Gantt) with a separate bar for each major portion of the Work or operation, identifying first work day of each week.

2. **Program:** Use **Microsoft Project**, latest version.
3. **Sequence of Listings:** Utilize the Table of Contents of this Project Manual and the chronological order **of the start of each item of work**.
4. **Scale and Spacing:** Provide space for notations and revisions.
5. **Sheet Size:** To be coordinated with Construction Administrator.
6. **Weather Days Allowance:** The Contractor shall include as a separate identifiable activity on the Critical Path of the Construction Schedule, and activity labeled "Weather Days Allowance." Insert this activity immediately prior to the substantial completion milestone.

6.1 The Contractor shall be fully responsible for determining the number of weather delay days to be included in the Construction Schedule. This determination shall be based on the normal anticipated weather for the project location and the nature of the project work. The Construction Schedule shall be based on the contractor's determined weather delay allowance. The weather delay activity shall be included in the construction schedule immediately prior to the Substantial Completion milestone.

6.2 The minimal allowed duration of the Weather Days Allowance shall be calculated as follows (decimals rounded to nearest whole number):

$$\frac{\text{Contract Time}}{\text{(Calendar Days)}} \text{ multiplied by } 7 \text{ equals } \text{Weather Days Allowance (Calendar Days)}$$

365

6.3 The Contractor shall insert an activity in the Critical Path of the Construction Schedule to reflect weather day occurrences when weather days are experienced and accepted by the Owner. Identify this activity as a weather delay.

6.4 The Contractor shall reduce duration of Weather Days Allowance activity as weather delays are experienced and inserted into the schedule. Remaining weather days in Weather Day Allowance at completion of project is considered float. Weather delay, when justified, are considered allowable, non compensable.

**G. Content**

1. Show complete sequence of construction by activity, with dates beginning and completion of each element of construction.
2. Identify each item by specification section numbers.
3. Identify work of separate phases and other logically grouped activities.
4. Show accumulated percentages of completion of each item, and total percentage of Work completed, as of the **first** day of each month.
5. Provide separate schedule of submittal dates for shop drawings, product data, and samples, Owner/Agency furnished products and any products identified as under Allowances, and dates reviewed submittals will be required from Engineer/Engineer. Indicate decision dates for selection of finishes.
6. Indicate delivery dates for Owner/Agency furnished products and any products identified as under Allowances.
7. Indicate critical path with original baseline indicated.

8. Coordinate content with Schedule of Values specified in Section 01 29 76 "Progress Payment Procedures."

**H. Submittals and Revisions To Schedules**

1. An initial bar graph schedule is to be prepared by the General Contractor and submitted to the Construction Administrator. Refer to Article 1.5.
2. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
3. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
4. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect.
5. Schedules must be revised monthly and when the actual schedule of significant items varies more than **seven (7) days** from the proposed schedule.
6. Submit revised Construction Schedules for each Application for Payment.
7. Submit **four (4)** copies of the Construction Schedule to the Construction Administrator.

**I. Distribution**

1. Distribute copies of the Construction Schedules to Construction Administrator, Engineer, Owner, Subcontractors, suppliers, and other concerned parties.
2. Instruct recipients to promptly report, in writing, problem anticipated by projections indicated in schedules.

**01 32 33 PHOTOGRAPHIC DOCUMENTATION**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Related Sections:** The following Sections contain requirements that relate to this section
  1. **Section 01 29 76 "Progress Payment Procedures"** submission of Schedule of Values and Applications for payment.
- C. On the date the work is begun and every **seven (7)** days thereafter (typically at the end of the week - until the work is at least 95 percent complete), the Contractor shall have photographs of the construction taken by an individual approved by the Owner.
- D. Photographs: Provide a digital camera to take **twelve-(12)** or more photos each time. Deliver 1 sets of photo files on CD-ROM and one set of prints to the Construction Administrator for DCS. Label each CD-ROM with project name and the date the photographs were taken. With each submittal provide an index sheet of digital photos and where the photos were taken.
- E. As photographs are a record of the work progress, they shall be taken each month, whether or not they show work done during the preceding month. Deliver digital photos to the Construction Administrator within **five (5)** Calendar Days of their taking.

**01 33 00 SUBMITTAL PROCEDURES**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Summary**
1. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including but not limited to the following:
    - 1.1 **Submittal schedule.**
    - 1.2 **Shop Drawings.**
    - 1.3 **Product Data.**
    - 1.4 **Samples.**
    - 1.5 **Quality assurance submittals.**
    - 1.6 **Proposed "Substitutions/Equals".**
    - 1.7 **Warranty samples.**
    - 1.8 **Coordination Drawings.**
    - 1.9 **O & M Manuals**
- C. Administrative Submittals:** Refer to other Division 01 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
1. **Permits.**
  2. **Applications for Payment.**
  3. **Performance and payment bonds.**
  4. **Contractor's construction schedule.**
  5. **Daily construction reports.**
  6. **Construction Photographs.**
  7. **Insurance certificates.**
  8. **List of subcontractors.**
  9. **Subcontractors/Suppliers FEIN #'s and Connecticut tax registration #'s.**
- D. Related Sections:** The following Sections contain requirements that relate to this Section:
1. Division 01 Section 01 25 00 "Substitution Procedures" specifies requirements for submittal of requests for equals and substitutions.
  2. Division 01 Section 01 29 76 "Progress Payment Procedures" specifies requirements for submittal of the Schedule of Values.
  3. Division 01 Section "Project Coordination" 01 31 13 for Project Coordination documents.
  4. Division 01 Section 01 31 19 "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
  5. Division 01 Section 01 32 16 "Construction Progress Schedules" for requirements for construction scheduling and reporting progress of work.



6. Division 01 Section 01 32 33 "Photographic Documentation" specifies requirements for submittal of periodic construction photographs.
7. Division 01 Section 01 45 00 "Quality Control" specifies requirements for submittal of inspection and test reports and mockups.
8. Division 01 Section 01 77 00 "Closeout Procedures" specifies requirements for submittal of Project Record Documents and warranties at project closeout.
9. Division 01 Section 01 78 30 "Warranties and Bonds".

**E. Definitions**

1. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended and as identified in the Specification Divisions 02 through 49.
  - 1.1 Preparation of Coordination Drawings is specified in Division 01 Section 01 31 13 "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
2. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.
3. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

**F. Submittal Procedures**

1. **Coordination:** Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 1.1 Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 1.2 Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - 1.2.1 The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
    - 1.2.2 The Engineer reserves the right to reject incomplete submitted packages.
  - 1.3 **Processing:** To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for re-submittals.
    - 1.3.1 Allow **fourteen (14)** calendar days for initial review. Allow additional time if the Engineer must delay processing to permit coordination with subsequent submittals.
    - 1.3.2 If an intermediate submittal is necessary, process the same as the initial submittal.
  - 1.4 Allow **fourteen (14)** calendar days for reprocessing each submittal.

- 1.5 No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.
  2. **Submittal Preparation:** Place a permanent label, title block or **8-1/2 inches x 11 inches** cover page approved by the Engineer, on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
    - 2.1 **Electronic submittals are preferred.** If paper copies are provided the minimum number of copies required for each submittal shall be **four (4)** or as determined otherwise at the pre-construction conference or by the Construction Administrator.
    - 2.2 Provide a space approximately **4 inches by 5 inches** on the label, beside the title block or on the cover page on Shop Drawings to record the Contractor's review and approval markings and the action taken.
    - 2.3 Include the following information on the label for processing and recording action taken.
      - 2.3.1 **Project Name and State of Connecticut Project Number.**
      - 2.3.2 **Date.**
      - 2.3.3 **Name and address of the Engineer, Construction Administrator, and Owner Representative.**
      - 2.3.4 **Name and address of the Contractor.**
      - 2.3.5 **Name and address of the subcontractor.**
      - 2.3.6 **Name and address of the supplier.**
      - 2.3.7 **Name of the manufacturer.**
      - 2.3.8 **Number and title of appropriate Specification Section.**
      - 2.3.9 **Drawing number and detail references, as appropriate.**
      - 2.3.10 **Indicate either initial or resubmittal.**
      - 2.3.11 **Indicate deviations from Contract Documents.**
      - 2.3.12 **Indicate if "equal" or "substitution".**
  3. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Engineer using a transmittal form. Copy the Construction Administrator on the transmittal. The Engineer will return all submittals to the Contractor after action is taken with a complete copy of the submittal package and one complete copy of the submittal package. The Engineer will not accept submittals received from sources other than the Contractor.
    - 3.1 On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- G. Submittal Schedule:**
1. After development and review by the Owner and Engineer acceptance of the Contractor's Construction or CPM schedule prepare a complete schedule of

submittals. Submit the schedule to the Construction Administrator within **fourteen (14)** Calendar Days of Contract Award.

- 1.1** Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction or CPM Schedule.
- 1.2** Prepare the schedule in chronological order. Provide the following information:
  - 1.2.1** Schedule date for the initial submittal.
  - 1.2.2** Related section number.
  - 1.2.3** Submittal category (Shop Drawings, Product Data, or Samples).
  - 1.2.4** Name of Subcontractor.
  - 1.2.5** Description of the part of Work covered.
  - 1.2.6** Scheduled date for resubmittal.
  - 1.2.7** Scheduled date for the Engineer's final release of approval.
- 2. Submittal Schedule:** Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Engineer and additional time for handling and reviewing submittals required by those corrections.
  - 2.1** Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2.2** Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 2.3** Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - 2.3.1** Submit revised submittal schedule to reflect changes in current status and timing for submittals.
- 3. Coordination:** Coordinate preparation and processing of submittals with performance of construction activities.
  - 3.1** Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 3.2** Submit all submittal items required for each specification section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  - 3.3** Submit action submittals and informational submittals required by the same specification section as separate packages under separate transmittals.
  - 3.4** Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

- 3.4.1** **Engineer and Construction Administrator** reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- 3.5** **Processing Time:** Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on **Engineer's** receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- 3.5.1** **Initial Review:** Allow **fourteen (14)** Calendar Cays for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. **Engineer** will advise Contractor when a submittal being processed must be delayed for coordination with related submittals not yet received. Additional time will be required if processing must be delayed to permit review of related subsequent submittals.
- 3.5.2** **Intermediate Review:** If intermediate submittal is necessary, process it in same manner as initial submittal.
- 3.5.3** **Resubmittal Review:** Allow **fourteen (14)** Calendar Days for review of each resubmittal.
- 3.5.4** **Mass Submittals:** **Six (6)** or more submittals in **one (1)** Calendar Day, **twenty (20)** or more submittals in **seven (7)** Calendar Days or submittals with **fifty (50)** or more pages. If "Mass Submittals" are received, Engineer's review time stated above may be extended as necessary to perform proper review. Engineer will review "Mass Submittals based upon priority determined by Engineer after consultation with Owner and Contractor.
- 3.6** **Distribution:** Following response to the initial submittal, print and distribute copies to the Construction Administrator, Engineer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
- 3.6.1** When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- 3.7** **Schedule Updating:** Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

**H. Daily Construction Reports**

1. Prepare a daily construction report recording the following information concerning events at the site, and submit duplicate copies to the Construction Administrator at weekly intervals:
  - 1.1 **List of subcontractors at the site.**
  - 1.2 **Approximate count of personnel at the site.**
  - 1.3 **High and low temperatures, general weather conditions.**
  - 1.4 **Accidents and unusual events.**

- 1.5 **Meetings and significant decisions.**
- 1.6 **Stoppages, delays, shortages, and losses.**
- 1.7 **Meter readings and similar recordings.**
- 1.8 **List of equipment on site and identify if idle or in use.**
- 1.9 **Orders and requests of governing authorities.**
- 1.10 **Change Orders received, start and end dates.**
- 1.11 **Services connected, disconnected.**
- 1.12 **Equipment or system tests and startups.**
- 1.13 **Substantial Completion's authorized.**
- 1.14 **Equals or Substitutions approved or rejected.**

**I. Shop Drawings**

- 1. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- 2. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
  - 2.1 Dimensions.
  - 2.2 Identification of products and materials included by sheet and detail number.
  - 2.3 Compliance with specified standards.
  - 2.4 Notation of coordination requirements.
  - 2.5 Notation of dimensions established by field measurement.
  - 2.6 Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least **8-1/2 inches by 11 inches** but no larger than **33 inches by 42 inches**.
    - 2.6.1 **Electronic submittals are preferred** but if paper copies are submitted Submit **one (1)** reproducible media and **four (4)** prints as directed by the Construction Administrator. The Contractor's submittal shall identify the specification section and/or drawing number applicable to the submittal.
    - 2.6.2 Details shall be large scale and/or full size.
- 3. The Contractor shall review the Shop Drawings, stamp with this 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 subcontractor. Shop Drawings shall be properly identified as specified for item, material, workmanship, and project number. At the submission, the Contractor shall inform the Engineer, in writing of any deviation in the shop drawings from the requirements of the Contract Documents.
- 4. The Engineer will review and comment on shop drawings with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. Refer to Article 5 of the General Conditions. Shop Drawings

received by the Engineer that indicate insufficient study of drawings and specifications, illegible portions or gross errors, will be rejected outright. Such rejections shall not constitute an acceptable reason for granting the Contractor additional time to perform the work.

5. The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected copies of Shop Drawings until fully reviewed.
6. Upon final review submit **four (4)** additional prints, same as submitted, for use by the Construction Administrator.
7. The Engineer's review and comments on Shop Drawings shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents.
8. Only final reviewed Shop Drawings are to be used on the Project site.
9. The Work installed shall be reviewed in accordance with the Shop Drawings and the drawings and specifications. Final Review of the Shop Drawings by the Engineer shall constitute acceptance by the State and the Engineer of a variation or departure that is **clearly identified**. If the contractor believes notations made by the Engineer/Engineer increases the value or scope of the CD's, the contractor must provide written notice to the Construction Administrator within seven (7) days of this issue. Final reviewed Shop Drawings shall not replace or be used as a vehicle to issue or incorporate change orders or substitutions. Substitutions shall be submitted in accordance with Division 01 Section 01 25 00 "Substitution Procedures".

**J. Product Data**

1. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, schedules, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
  - 1.1 Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
    - 1.1.1 **Manufacturer's printed recommendations.**
    - 1.1.2 **Compliance with trade association standards.**
    - 1.1.3 **Compliance with recognized testing agency standards.**
    - 1.1.4 **Application of testing agency labels and seals.**
    - 1.1.5 **Notation of dimensions verified by field measurement.**
    - 1.1.6 **Notation of coordination requirements.**
  - 1.2 Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
  - 1.3 **Preliminary Submittal:** Submit a preliminary single copy of Product Data where selection of options is required.
  - 1.4 **Submittals:** **Electronic copies are preferred** but if paper copies are provided submit **four (4)** copies of each required submittal; submit **five (5)** copies where required for maintenance manuals.

The Engineer will retain **one (1)** and will return the other marked with action taken and corrections or modifications required.

**1.4.1** Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

**1.5 Distribution:** Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

**1.5.1** Do not proceed with installation until a copy of Product Data is in the Installer's possession.

**1.5.2** Do not permit use of unmarked copies of Product Data in connection with construction.

**K. Quality Assurance Submittals**

**1.** Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

**2. Certifications:** Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

**2.1 Signature:** Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

**3. Inspection and Test Reports:** Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 01 Section 01 45 00 "Quality Control."

**L. Engineer's Action:**

**1.** Except for submittals for the record or information, where action and return is required, the Engineer will review each submittal, mark to indicate action taken, and return promptly.

**1.1** Compliance with specified characteristics is the Contractor's responsibility.

**2. Action Stamp:** The Engineer will stamp each submittal with a uniform, action stamp. The Engineer will mark the stamp appropriately to indicate the action taken, as follows:

**2.1 Final Unrestricted Release:** When the Engineer marks a submittal "**Approved**" the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.

**2.2 Final-But-Restricted Release:** When the Engineer marks a submittal "**Approved as Noted**," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Submit corrected copies for record. Final payment depends on that compliance.

**2.3 Returned for Resubmittal:** When the Engineer marks a submittal "**Rejected, or Revise and Resubmit**," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery,

or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

**2.3.1** Do not use, or allow others to use, submittals marked "Rejected, or Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

**2.4 Other Action:** Where a submittal is for information or record purposes or special processing or other activity, the Engineer will return the submittal marked "**Reviewed for Record.**"

**3. Unsolicited Submittals:** The Engineer will discard unsolicited submittals without action.

## 01 35 16 ALTERATION PROJECT PROCEDURES

**A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**B. Summary**

**1.** This Section includes administrative and procedural requirements for performing alteration and renovation Work.

**2. Related Sections:** The following Sections contain requirements that relate to this Section:

**2.1** Division 01 Section 01 31 13 "Project Coordination" for procedures for coordinating cutting and patching with other construction activities.

**2.2** Division 01 Section 01 73 29 "Cutting and Patching" for procedures for cutting and patching.

**2.3** Refer to other Sections for specific requirements and limitations applicable to performing alteration Work with individual parts of the Work.

**2.4** Requirements of this Section apply to mechanical and electrical installations. Refer to Divisions 23 and 26 Sections for other requirements and limitations applicable to renovation Work by mechanical and electrical installations.

**C. Products For Patching And Extending Work:**

**1. New Materials:** As specified in product sections; match existing Products and Work .for patching and extending Work.

**2. Type and Quality of Existing Products:** Determine by inspecting and testing Products where necessary, referring to existing Work as a standard.

**D. Inspection**

**1. General:**

**1.1** Verify that demolition is complete and areas are ready for installation of new Work.

**1.2** Beginning of restoration Work means acceptance of existing conditions.



**E. Preparation:**

1. Cut, move, or remove items as are necessary for access to alterations and renovation Work. Replace and restore at completion.
2. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
3. Remove debris and abandoned items from area and from concealed spaces.
4. Prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.
5. Close openings in exterior surfaces to protect existing Work and salvage items from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

**G. Installation:**

1. Coordinate Work of alterations and renovations to expedite completion and if required sequence Work to accommodate Owner occupancy.
2. Remove, cut and patch Work in a manner to minimize damage and to provide restoring Products and finishes to original and or specified condition in accordance with **Section 01 73 29 "Cutting and Patching"**.
3. Refinish visible existing surfaces to remain, to specified condition for each material, with neat transition to adjacent finishes in accordance with **Section 01 73 29 "Cutting and Patching"**.
4. In addition to specified replacement of ***equipment***, restore existing related ***plumbing, and electrical***, systems to full operational condition.
5. Recover and refinish Work that exposes mechanical and electrical Work exposed accidentally during the Work.
6. Install Products as specified in individual sections.

**H. Transitions:**

1. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patch work to match existing adjacent Work in texture and appearance.
2. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Engineer/Engineer.

**I. Adjustments:**

1. Where a change of plane of  $\frac{1}{4}$  inch in *12 inches* or more occurs, request recommendation from Engineer for providing a smooth transition.
2. Fit Work at penetrations of surfaces as specified in Section 01045 "Cutting and Patching".

**J. Repair of Damaged Surfaces:**

1. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing imperfections.
2. Repair substrate prior to patching finish.

**K. Finishes:**

1. Finish surfaces as specified in individual Product sections.

2. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

**L. Cleaning:**

1. In addition cleaning specified in **Section 01 77 00 "Closeout Procedures"**, clean Agency occupied areas of Work.

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**01 35 19      CONFINED SPACE ENTRY (Not Used)**

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**01 35 53      SECURITY PROCEDURES**

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- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B.** Provide a security program and facilities to protect work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.
- C.** The General Contractor shall be solely responsible for damage, loss, or liability due to theft or vandalism.
- D. Identification Badges for General Contractor's Personnel and Visitors:**
1. The General Contractor will provide each person working or visiting at the site with an identification badge, bearing the name of the General Contractor, subcontractors, design professionals, and a number. As badges are assigned, a record shall be kept by the General Contractor and given to the Construction Administrator and User Agency Administrator. Update and correct the records of all badges issued on a semi-monthly basis.
  2. Badges are to be worn on outer garment where visible at all times while at the construction site, return them to the General Contractor's field office at the end of each day and pick them up there each morning.
- E. Parking Stickers:** All vehicles parking in the General Contractor's parking lot and those used around the site require an ID sticker. They will be issued by the User Agency. Each General Contractor shall apply for parking stickers through the Construction Administrator no more than semi-monthly and shall keep record of all stickers issued.
- F. Criminal History Record Check and Background Investigation:** All employees and personnel performing services for contractors or subcontractors must have criminal history record check and background investigation per DESPP requirements. Contractor is responsible for all costs. See following "DESPP Criminal History Record Check Instructions" and "Background Investigation Q&A" for additional information.

**End**  
**Section 01 30 00**  
**Administrative Requirements**



**STATE OF CONNECTICUT  
DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION  
HUMAN RESOURCES**

**CRIMINAL HISTORY RECORD CHECK INSTRUCTIONS**

All employees and personnel performing services for contractors or sub-contractors on or at the Department of Emergency Services and Public Protection (DESPP) facilities are required, under their contracts, to have background investigations completed by the Department of Emergency Services and Public Protection (DESPP). Contractors are responsible for costs associated with criminal history record checks (State & Federal) including fingerprinting costs. All contractors' employees must have security approval by DESPP prior to starting work. Contractors must submit the employee information required by the department upon contract award. Contractors are to include contingency employees who may be utilized to cover absenteeism. No Contractor's employee will be admitted to DESPP facilities without identification and a completed criminal history record and background check.

**INSTRUCTIONS:**

To begin the background process, appointments are coordinated by contacting Chastity DeLillo in Human Resources at (860) 685-8394. Processing is conducted by appointment only at 1111 Country Club Road in Middletown, CT. When you arrive, you are to inform the Trooper at the front desk you need to go to Human Resources.

**REQUIRED IDENTIFICATION:**

A current and valid photo id with a signature (license or state id) or a valid passport.

**FEES: (subject to change without notice)**

Required Criminal History Record Checks fees for State Contractor are as follows:

Processing Fee (In-State Only)	\$15.00	Cash (exact change), *Check/Money Order made payable to: "Treasurer-State of CT"
State Fingerprinting Fee	\$50.00	
Federal Fingerprinting Fee	\$14.75	

\*If paying by check/money order, a separate check/money needs to be made for each fee made **payable to "Treasurer-State of CT"**.

It is the companies' responsibility to make contact with Chastity DeLillo at (860) 685-8394 to receive verification of conditional clearance before employment can begin. Please note conditional clearance is pending the outcome of the background investigation for in state contractors only. If sub-contractors are working from out of state, the background must be completed prior to starting.

Phone: (860) 685-8200 Fax: (860) 685-8356  
1111 Country Club Road  
Middletown, CT 06457

*An Affirmative Action/Equal Employment Opportunity Employer*

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**The Department of Emergency Services and Public Protection (DESPP)  
Background Investigation Q & A**

**Why is a background required?**

DESPP as a law enforcement agency standards are different than many other State agencies so we require a background investigation. Also, depending on where in the agency the individual works, they may have access to information.

**What is the process?**

The applicant or company schedules an appointment to fill out the appropriate paperwork (waiver) with Human Resources and have fingerprints taken.

**What type of background do sub-contractors/contractors receive?**

A Type C (basic background investigation)

**What does a Type C background consist of?**

- Criminal check
- Motor vehicle record check
- Financial check (probate and/or judicial information)
- Federal and state fingerprint results

**Are there fees and if so what are they?**

Yes, they are as follows: (all fees are subject to change without notice)

- Processing fee \$15 (in state only)
  - Out of state do not pay, they are not being processed through our agency.
- State fee \$50
- Federal fee \$14.75

**How are fingerprint fees to be paid?**

The Fingerprint Unit allows the following payment forms: Cash (exact change), check or money order made out to **Treasurer – State of Connecticut**

**What is needed for the scheduled appointment with Human Resources?**

Valid and current photo id with a signature (license or state id) or valid passport (copy will be made) and individuals need to know their social security number.

**Are fingerprints considered a background investigation?**

No, fingerprints are only a records check to include State and Federal criminal history checks.

**If I had fingerprints taken for a pistol permit or another position, do I have to have them redone?**

Yes, although your fingerprints are on file they are not for our "hiring" purposes and may be outdated; therefore, you will need to be re-fingerprinted.

**What happens if something shows up on the fingerprint results?**

The applicant will be contacted and meet with the Human Resources Administrator to go over the results and discuss what actions if any need to be taken.

**The Department of Emergency Services and Public Protection (DESPP)  
Background Investigation Q & A**

**Am I able to go to my local police department to be fingerprinted?**

No. Fingerprints are to be done at the DESPP Fingerprint Unit to avoid any issues reading fingerprint results or not being done correctly. The only time we allow this is if someone is from out of state and a packet needs to be sent from Human Resources with instructions.

**Who can my information be released to?**

We do not and cannot release any of the information received from your fingerprint or background results. The results are confidential and used for our agency purposes only. The information is kept in Human Resources.

**If I have a background conducted for DESPP, can I use that clearance for other State Agencies/Police Departments?**

Backgrounds conducted with DESPP are for clearance for our agency only.

**How long does it take to receive clearance?**

The employer should contact Human Resources (Chastity DeLillo) a couple days after the individual's appointment to see if results have been received.

**Do backgrounds have to be completed before individuals can begin?**

If an individual works in state, they may be given conditional clearance from their fingerprint results. If they are working from out of state, backgrounds have to be completed before they can begin.

**How long are backgrounds good for?**

If an individual has had a background completed but left the agency and has been gone for six (6) months or longer, they will have to complete the whole process again.

**01 40 00 QUALITY REQUIREMENTS**

A. **Summary:** Section 01 40 00 Quality Requirements contains the following Subsections:

01 42 16	Definitions	Not Used <input type="checkbox"/>
01 42 19	Reference Standards	Not Used <input type="checkbox"/>
01 45 00	Quality Control	Not Used <input type="checkbox"/>
01 45 23	Testing For Indoor Air Quality, Baseline IAQ, & Materials	Not Used <input checked="" type="checkbox"/>

**01 42 16 DEFINITIONS**

A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. **Definitions**

1. **General:** Basic contract definitions are included in the General Conditions of the Contract for Construction.
2. **"Indicated":** The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited to this term.
3. **"Directed":** Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Engineer, requested by the Engineer, and similar phrases.
4. **"Approved":** The term "approved," when used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.
5. **"Regulations":** The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
6. **"Furnish":** The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
7. **"Install":** The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
8. **"Provide":** The term "provide" means to furnish and install, complete and ready for the intended use.
9. **"Installer":** An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

- 9.1** The term "experienced," when used with the term "installer," means having a minimum of **five (5)** previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
- 9.2 Trades:** Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
- 9.3 Assigning Specialists:** Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
- 9.3.1** This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- 10. "Project Site":** Is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other Work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- 11. "Testing Agencies":** A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

**01 42 19 REFERENCE STANDARDS**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Industry Standards:**
- 1. Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
  - 2. Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents unless a specific date is indicated in the Contract Documents or the governing regulations cited herein.
  - 3. Conflicting Requirements:** Where compliance with **two (2)** or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent and highest quality requirement. Request a decision from the Engineer before proceeding on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.



4. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Request a clarification from the Engineer regarding uncertainties before proceeding.
  5. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
- C. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
1. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Thompson Gale's "Encyclopedia of Associations," available in most libraries.
- D. **Governing Regulations And Authorities:**
1. **Copies of Regulations:** Obtain copies of the “**latest applicable State Codes**” and the following regulations and retain at the Project Site to be available for reference by parties who have a reasonable need during submittals, planning, and progress of the Work, until Substantial Completion.
    - 1.1 For a list of the “**latest applicable State Codes**” and how they can be obtained see [www.ct.gov/dcs](http://www.ct.gov/dcs) (Connecticut Department of Administrative Services – Division of Construction Services website) and click on “Office of State Building Inspector”. Also visit the [www.ctdol.state.ct.us](http://www.ctdol.state.ct.us) Connecticut Department of Labor website.
- E. **Submittals:**
1. **Permits, Licenses, and Certificates:** For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents.

**01 45 00 QUALITY CONTROL**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Summary**
1. This Section includes administrative and procedural requirements for quality-control services.
  2. Quality-Control services include fire alarm acceptance testing, inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Owner.
  3. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve

Contractor of responsibility for compliance with Contract Document requirements.

4. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
  - 4.1 Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 4.2 Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
  - 4.3 Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

**C. Related Sections:** The following Sections contain requirements that relate to this Section:

1. Division 01 Section **01 33 00 "Submittal Procedures"** specifies requirements for development of a schedule of required tests and inspections.
2. Division 01 Section **01 73 29 "Cutting and Patching"** specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.
3. Division 01 Section **01 77 00 "Closeout Procedures"**, specific requirements for contract closeout procedures.

**D. Responsibilities**

1. **Contractor Responsibilities:** Unless otherwise indicated as the responsibility of another identified entity, the Owner, through the Construction Administrator, shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. All tests required by the individual specification sections are required to be scheduled and notification given to the Construction Administrator **24 to 48** hours in advance of the test/inspection as applicable. Costs for these services are not included in the Contract Sum.
  - 1.1 Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.
  - 1.2 Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services.
    - 1.2.1 Such services include Special Inspections as required by the latest edition of the "Connecticut State Building Code".
    - 1.2.2 Where the Owner has engaged a testing agency for testing and inspecting part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the

Owner. The Owner will engage the services of a qualified Special Inspector for this project. The Special Inspector, as a representative of the Owner, shall document and confirm compliance with the provisions of the Connecticut State Building Code for Special Inspections.

**1.2.3** Materials and assemblies for this project will be tested and construction operations inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered nor shall it obligate the State for final acceptance.

**1.2.4** The Owner's use of testing and inspection services shall in no way relieve the Contractor of the responsibility to furnish materials and finished construction in full compliance with the Contract Documents and the Connecticut State Building Code.

**2. Retesting:** The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

**2.1** The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated non-compliance with Contract Document requirements.

**2.2** The Owner will issue a credit change order to cover all costs incurred related to all re-tests/re-inspections due to non-compliance to the Contract Documents, including but not limited to the Owner's costs and the Consultant's costs.

**3. Associated Services:** Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the Agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

**3.1** *Provide access to the Work.*

**3.2** *Furnish incidental labor and facilities necessary to facilitate inspections and tests.*

**3.3** *Provide security and protection of samples and test equipment at the Project Site.*

**4. Duties of the Testing Agency:** The independent testing agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Construction Administrator, Engineer and the Contractor in performance of the testing agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.

**4.1** The testing agency shall notify the Construction Administrator and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

**4.2** The testing agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

- 4.3 The testing agency shall not perform any duties of the Contractor.
- 4.4 Structural testing shall include:
  - 4.4.1 Weld inspections.
  - 4.4.2 Bolted connections
  - 4.4.3 AISC certifications
  - 4.4.4 Qualified inspectors
- 5. Owner will pay for the services of an independent testing agency laboratory to perform inspections, tests and other services required by the Specifications except as noted below, listed for which the Owner will issue a deduct change order to cover the cost associated with these tests:
  - 5.1 When the Contractor notifies the Construction Administrator and/or Testing Agency less than **24 hours** before the expected time of testing.
  - 5.2 When the Contractor requires testing for his own convenience.
  - 5.3 When the Contractor schedules a test and is not ready for the required test.
- 6. Submit reports of tests that are part of the submittal requirements which indicate compliance or non-compliance with the specified standard.
- 7. See also General Conditions Article 16 "Inspections & Tests".

**E. Submittals**

- 1. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Construction Administrator. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.
  - 1.1 Submit additional copies of each written report directly to the governing authority, when the authority so directs.
  - 1.2 Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
    - 1.2.1 Date of issue.
    - 1.2.2 Project title and number.
    - 1.2.3 Name, address, and telephone number of testing agency.
    - 1.2.4 Dates and locations of samples and tests or inspections.
    - 1.2.5 Names of individuals making the inspection or test.
    - 1.2.6 Designation of the Work and test method.
      - .1 Identification of product and Specification Section.
      - .2 Complete inspection or test data.
      - .3 Test results and an interpretation of test results.
      - .4 Ambient conditions at the time of sample taking and testing.
      - .5 Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
      - .6 Name and signature of laboratory inspector.

.7 Recommendations on re-testing.

**F. Quality Assurance**

1. **Qualifications for Service Agencies:** Engage inspection and testing service agencies, including independent testing laboratories, that are pre-qualified as complying with the National Voluntary Laboratory Accreditation Program and that specialize in the types of inspections and tests to be performed.

1.1 Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

**G. Repair And Protection**

General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 01 **Section 01 73 29 "Cutting and Patching."**

1. Protect constructions exposed by or for quality-control service activities, and protect repaired construction.

2. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

01 45 23

**TESTING FOR INDOOR AIR QUALITY, BASELINE IAQ, & MATERIALS (Not Used)**

**End  
Section 01 40 00  
Quality Requirements**

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**01 50 00 TEMPORARY FACILITIES AND CONTROLS**

A. **Summary:** Section 01 50 00 Temporary Facilities And Controls contains the following subsections:

01 51 13	Temporary Electricity And Lighting	Not Used <input type="checkbox"/>
01 51 16	Temporary Fire Protection	Not Used <input checked="" type="checkbox"/>
01 51 23	Temporary Heating, Cooling And Ventilating	Not Used <input checked="" type="checkbox"/>
01 51 33	Temporary Telecommunications	Not Used <input checked="" type="checkbox"/>
01 51 36	Temporary Water	Not Used <input type="checkbox"/>
01 52 13	Field Offices And Sheds	Not Used <input checked="" type="checkbox"/>
01 52 19	Temporary Sanitary Facilities	Not Used <input type="checkbox"/>
01 54 00	Construction Aids	Not Used <input type="checkbox"/>
01 55 13	Temporary Access Roads	Not Used <input checked="" type="checkbox"/>
01 55 16	Haul Routes	Not Used <input checked="" type="checkbox"/>
01 56 00	Temporary Barriers And Enclosures	Not Used <input type="checkbox"/>
01 56 43	Temporary Protection	Not Used <input type="checkbox"/>
01 57 19	Temporary Environmental Controls	Not Used <input checked="" type="checkbox"/>
01 57 21	Environmental Management	Not Used <input checked="" type="checkbox"/>
01 57 23	Temporary Storm Water Control	Not Used <input checked="" type="checkbox"/>
01 57 30	Indoor Environmental Control	Not Used <input checked="" type="checkbox"/>
01 57 40	Construction Indoor Air Quality Management Plan	Not Used <input checked="" type="checkbox"/>
01 58 13	Temporary Project Signage	Not Used <input type="checkbox"/>

**01 51 13 TEMPORARY ELECTRICITY AND LIGHTING**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Provide service required for construction with branch wiring and distribution boxes located to provide power and lighting by construction-type extension cords. Meter shall be provided and installed by the Contractor.
- C. All Connect to existing service, provide branch wiring and distribution boxes located to provide power and lighting by construction-grade extension cords. Owner will pay cost of energy used. Take measures to conserve energy. Provide lighting for construction operations. At the termination of construction, return the facilities to their original condition.
- D. **Power Distribution System:** Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- E. **Temporary Lighting:** Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.

**01 51 16      TEMPORARY FIRE PROTECTION (Not Used)**

**01 51 23      TEMPORARY HEATING, COOLING, AND VENTILATING (Not Used)**

**01 51 33      TEMPORARY TELECOMMUNICATIONS (Not Used)**

**01 51 36      TEMPORARY WATER**

- A.    **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B.    **Existing Water Service:** Water for construction purposes may be taken from the existing service. The Contractor shall provide connections, approved backflow prevention device, meter and pipe to the water main or nearest hydrant, subject to the approval of DCS. Upon completion of work, the Contractor shall remove the temporary connections and backfill if necessary. If new water service is installed before construction is complete, the new system may be used provided it is returned to the Owner in as-new condition. The Contractor shall pay for the water used, as metered.

**01 52 13      FIELD OFFICES AND SHEDS (Not Used)**

**01 52 19      TEMPORARY SANITARY FACILITIES**

- A.    **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B.    **General Contractor's Construction Work:** Provide toilet facilities for General Contractor's and subcontractor's employees engaged on the Project, including employees of other contractors in accordance with the OSHA Table D-1 (29CFR CH.XVII, OSHA Standard 1926.51)\_below. Locate toilets where directed and maintain them in a sanitary condition.

Number Of Employees	Minimum Number Of Facilities*
20 or less	1 toilet
20 or more	1 toilet and 1 urinal per 40 employees
200 or more	1 toilet and 1 urinal per 50 employees
*Toilet/Urinal Combinations shall count as only one facility.	

- 1.    Job sites, not provided with a sanitary sewer, shall be provided with one of the following toilet facilities unless prohibited by State Codes:
  - 1.1    Chemical toilets;
  - 1.2    Recirculating toilets;
  - 1.3    Combustion toilets.



2. Inside buildings, locate toilet facilities no more than 4 stories or 60 feet above or below, nor more than 500 feet travel on the same level from the work location of any person.
  3. Locate toilet facilities no more than 1000 feet from any work location.
- C. The General Contractor shall provide, where directed, chemical toilets with toilet tissue, plus wash basins with water, soap and paper towels. The General Contractor shall maintain the facilities in a sanitary condition.
- D. If women are employed in the work, provide separate, designated facilities for them of the same kind. Provide an adequate number of each kind of facility for each gender.

**01 54 00 CONSTRUCTION AIDS**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. The General Contractor shall furnish tools, apparatus and appliances, hoists and/or cranes and power for same, scaffolding, runways, ladders, temporary supports and bracing and similar work or material necessary to insure convenience and safety in the execution of the Contract Documents except where this is otherwise specified in any Technical Specification Section. All such items shall meet the approval of DCS but responsibility for design, strength, and safety shall remain with the General Contractor. All such items shall comply with Federal OSHA regulations and applicable codes, statutes, rules and regulations, including compliance with the requirements of the current edition of the "Manual of Accident Prevention in Construction" published by the A.G.C. (Associated General Contractors of America) and the standards of the Connecticut Department of Labor (DOL).
- C. Staging/laydown areas, exterior, and interior, required for the execution of the Contract Documents, shall be furnished, erected, relocated if necessary, and removed by the general Contractor. Staging/laydown shall be maintained in a safe condition without charge to the Owner and for the use of all trades as needed.

**01 55 13 TEMPORARY ACCESS ROADS (Not Used)**

**01 55 16 HAUL ROUTES (Not Used)**

**01 56 00 TEMPORARY BARRIERS AND ENCLOSURES**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Provide barriers to prevent public entry into construction areas and to protect existing facilities from damage by construction operations.
- C. Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated on the Construction Documents, or enclose the entire construction site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.

1. **Chain Link Fence:** Provide chain link construction fencing with posts set in a compacted mixture of gravel and earth. Use a **six (6)** foot-high (minimum) chain link fence with top rail and filter fabric screening. At completion of the project, the Contractor must remove the construction fence completely, including all portions of below-ground footings. Fence posts must be removed, not sawn off flush with the soil line.
  2. **Security Enclosure and Lockup:** Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Provide keys to the Construction Administrator.
  3. **Storage/laydown areas:** Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- D. Provide covered walkways as required by governing authorities for public rights-of-way and for public access to existing buildings.
  - E. Provide barriers around **all** trees and plants designated to remain. Protect against vehicular traffic, materials' dumping, chemically injurious materials, puddles, or running water.
  - F. Provide temporary, insulated, weathertight closures at openings to the exterior to provide acceptable working conditions and protection for materials, to allow for temporary heating and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.
  - G. Barriers and enclosures shall be in conformance with code requirements. Do not block egress from occupied buildings unless necessary to further the work of the Contract. In this case, secure the Department's approval of an alternate egress plan.
  - H. See also **Division 00 General Condition, Article 19 "Protection of the Work, Persons, and Property.**

**01 56 43 TEMPORARY PROTECTION**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Protect buildings, roofing, equipment, furnishings, grounds, and plantings from damage. Any damage shall be repaired or otherwise made good at no expense to the State.
- C. Provide protective coverings and barricades to prevent damage. The General Contractor shall be held responsible for, and must make good at his own expense, any water, or other type of damage due to improper coverings. Protect the public and building personnel from injury.
- D. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- E. Provide protective coverings for walls, projections, jambs, sills and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects and storage. Prohibit traffic and storage on waterproofed and roofed surfaces and on lawn and landscaped areas.
- F. See also **Division 00 General Condition, Article 19 "Protection of the Work, Persons, and Property.**

**01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS (Not Used)**

**01 57 21 ENVIRONMENTAL MANAGEMENT (Not Used)**

**01 57 23 TEMPORARY STORM WATER CONTROL (Not Used)**

**01 57 30 INDOOR ENVIRONMENTAL CONTROL (Not Used)**

**01 57 40 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN (Not Used)**

**01 58 13 TEMPORARY PROJECT SIGNAGE**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Project Sign:** General Contractor shall engage an experienced sign painter to apply graphics. The General Contractor shall request the Construction Administrator shall provide the General Contractor with all of the detailed illustration of the sign of the project sign, including but limited, format, wording, font size, color selection, and State Seal. Within seven (7) Calendar Days of the Date of the Commencement of the Work the General Contractor shall erect a Project Sign at the construction site, in a location designated by the DCS Project Manager and Construction Administrator.
- 1. Groundbreaking Ceremonies Sign:** For groundbreaking ceremonies only, provide a temporary tripod for the sign illustrated and described below. Make the tripod of 12 ft long 2" x 4"s (Stud Grade), beveled and bolted at the top. Provide approximately 5-ft between legs at grade. Provide a 6-ft long, 2" x 4" seat for the sign; locate 5-ft above grade and nail in place. Nail sign at four (4) places where edges intersect tripod legs. Drive a 24" long, pointed 2" x 4" stake into the earth next to each leg and nail to legs.
  - 2. Project Sign:** The General Contractor shall fabricate the Project Sign as follows:
    - 2.1** ¾ inch, exterior grade, A-B Fir plywood;
    - 2.2** mounted on preservative treated fir posts;
    - 2.3** painted both sides and all edges of sign and the posts with two coats of exterior, white, alkyd primer;
    - 2.4** borders and letters painted with "bulletin" (sign) paint;
    - 2.5** have a self-adhesive decal of the State seal to be provided by the Construction Administrator;
  - 3. Project Sign Detail:** Sign letter sizes, fonts, colors and related information are shown in the illustration available for download from the on-line DCS Library (3000 Series – Design Phase Forms).

- C.** The General Contractor shall remove and properly dispose of the Project Sign within **seven (7)** Calendar days after Acceptance of the Work of the project.

**End**  
**Section 01 50 00**  
**Temporary Facilities And Controls**

**01 70 00 EXECUTION AND CLOSEOUT REQUIREMENTS**

- A. **Summary:** Section 01 70 00 Execution and Closeout Procedures contains the following subsections:

01 71 23	Field Engineering	Not Used <input type="checkbox"/>
01 73 29	Cutting and Patching	Not Used <input type="checkbox"/>
01 74 13	Progress Cleaning	Not Used <input type="checkbox"/>
01 74 19	Construction Waste Management & Disposal	Not Used <input checked="" type="checkbox"/>
01 75 00	Starting And Adjusting	Not Used <input type="checkbox"/>
01 77 00	Closeout Procedures	Not Used <input type="checkbox"/>
01 78 23	Operation And Maintenance Data	Not Used <input type="checkbox"/>
01 78 30	Warranties And Bonds	Not Used <input type="checkbox"/>

**01 71 23 FIELD ENGINEERING**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. The General Contractor shall provide field engineering services to establish and record grades, lines, and elevations.

**01 73 29 CUTTING AND PATCHING**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. It is the responsibility of the Contractor to provide chases, channels or openings where needed.
- C. The Contractor shall install sleeves, inserts, and hangers furnished by the trades needing same.
- D. After installing work into openings, channels, and/or chases, the Contractor shall close same. If finishes are to be restored, the new work shall match the original and shall be done by the trade customarily responsible for the particular kind of work.
- E. Written permission shall be obtained from the Contractor before cutting beams, arches, lintels or other structural members.
- F. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
1. Contractor shall obtain written approval from the Engineer of the cutting and patching proposal before cutting and shall submit all Architect/Engineer approval letters to the Construction Administrator before patching the following structural elements:
    - 1.1 **Structural steel.**
    - 1.2 **Miscellaneous structural metals.**
    - 1.3 **Equipment supports.**
    - 1.4 **Piping, ductwork, vessels, and equipment.**
- G. Do cutting and patching to integrate all elements of the work. Provide penetrations of existing surfaces. Provide samples for testing. Seal penetrations through floors,

walls, ceilings, and roofs, as applicable; restore or preserve fire-rated and smoke-barrier construction. Construction and finishes shall match original work.

- H. The Contractor shall verify all dimensions before ordering any material or doing any work. Discrepancies shall be submitted to the Construction Administrator before proceeding with the work.
- I. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.
- J. Also see Division 00 General Conditions **Article 23 “Cutting, Fitting, Patching, and Digging”**.

#### 01 74 13 PROGRESS CLEANING

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **This Section includes:**
  - 1. Cleaning requirements during construction operations.
  - 2. Final cleaning prior to turning the project over to the Owner.
- C. **Quality Assurance**
  - 1. Coordinate with **Section 01 77 00 – Closeout Procedures.**
    - 1.1 Contractor shall provide progress cleaning that minimizes sources of food, water, and harborage available to pests.
- D. Utilize non-toxic cleaning materials and methods.
  - 1. Use natural cleaning materials where feasible. Natural cleaning materials include:
    - 1.1 abrasive cleaners: substitute 1/2 lemon dipped in borax.
    - 1.2 ammonia: substitute vinegar, salt and water mixture, or baking soda and water.
    - 1.3 disinfectants: substitute 1/2 cup borax in gallon water.
    - 1.4 drain cleaners: substitute 1/4 cup baking soda and 1/4 cup vinegar in boiling water.
    - 1.5 upholstery cleaners: substitute dry cornstarch.
- E. Maintain areas under the General Contractor’s control free of waste materials, debris, and rubbish. Maintain in a clean and orderly condition.
- F. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces before closing the space.
- G. Periodically clean interior areas before start of surface finishing and continue cleaning on an as-needed basis.
- H. The General Contractor shall control cleaning operations so that dust and other particulates will not adhere to wet or newly-coated surfaces.
- I. Remove waste materials, debris, and rubbish from site daily and dispose of legally off-site. No scrap/debris shall remain inside the building or anywhere on site upon final acceptance of the project.

**J. Final Cleaning:**

1. At completion of Work, remove all remaining waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces; leave Project clean and ready for occupancy.
  - 1.1 Provide final cleaning in accordance with ASTM E1971 and the approved Integrated Pest management (IPM) plan.

**K. See also Division 00 General Conditions, Article 24 "Cleaning Up".**

**01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL (Not Used)**

**01 75 00 STARTING AND ADJUSTING**

**A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**B. Summary:**

1. This Section includes administrative and procedural requirements for handling requests for building system start up and system demonstration and includes the following:

**1.1 Starting Systems.**

**1.2 Demonstration and instructions.**

**1.3 Testing, adjusting, and balancing.**

**C. Related Sections:** The following Sections contain requirements that relate to this Section:

1. Division 01 **Section 01 45 00 "Quality Control"** specifies quality assurance and inspecting services.
2. Division 01 **Section 01 77 00 "Closeout Procedures"** specifies requirements for contract close out requirements for system operation and maintenance data and extra materials.

**D. Starting Systems:**

1. Coordinate schedule for start-up of various equipment and systems.
2. Provide written notification to the Owner's Construction Administrator **thirty (30)** Calendar Days prior to start-up of each item.
3. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, and control sequence for other conditions that may cause damage.
4. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
5. Verify that wiring and support components are complete and tested.
6. Execute the start-up under supervision of manufacturer's representative, in accordance with manufacturer's instructions.
7. When referenced in individual specification sections, require manufacturer to provide an authorized representative to be present at the site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

8. Submit a written report in accordance with Division 01 **Section 01 45 00 "Quality Control"** that the equipment or system has been properly installed and is functioning properly.

**E. Demonstration and Instructions:**

1. Demonstrate operation and maintenance of Products to Owner and Agency Personnel **fourteen (14)** Calendar Days prior to substantial completion.
2. Demonstrate Project equipment and instruct in a classroom environment at location designated by the Construction Administrator and instructed by a qualified manufacturer's representative who is knowledgeable about the Project.
3. For equipment or systems requiring seasonal operation perform demonstration for season within **six (6)** months.
4. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner and Agency Personnel in detail to explain all aspects of operation and maintenance.
5. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, and maintenance, and shutdown of each item at agreed upon scheduled time and at equipment or designated location.
6. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during demonstration.
7. Starting and adjusting equipment does not constitute acceptance by the owner since commissioning is a requirement of this contract. Additionally, the warranty does not begin until substantial completion has been granted for that specific item.

**F. Testing, Adjusting, and Balancing:**

1. The Contractor will employ and pay for the testing services of an independent consultant to verify the testing, adjusting, and balancing.
2. Reports will be submitted by the independent testing consultant to the Construction Administrator indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.
3. The Owner may employ and pay for the services of an independent consultant to verify testing, adjusting, and balancing which was performed by the Contractor.

**01 77 00 CLOSEOUT PROCEDURES**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Substantial Completion:**
  1. Upon completion of the work, the General Contractor shall submit to the State a Certificate of Substantial Completion wherein the General Contractor certifies that all conditions of the Contract Documents have been met, and that the facility is ready for occupancy by the Agency. Issuance of a Certificate of Substantial Completion by the Owner shall be a pre-condition for payment by the Owner.



- 1.1 ***Preliminary Procedures: Before requesting inspection for Certification of Substantial Completion, complete the following. List exceptions in the request.***
  - 1.2 ***In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent (100%) completion for the portion of the Work claimed as substantially complete.***
    - 1.2.1 ***Include supporting documentation for completion as indicated in the Contract Documents and a statement showing all accounting of the Contract Documents.***
    - 1.2.3 ***If 100 percent (100%) completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete shall be provided as well as a schedule for completion of work.***
  - 1.3 ***Advise the Owner of pending insurance changeover requirements.***
  - 1.4 ***Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.***
  - 1.5 ***Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.***
  - 1.6 ***Submit as-built record drawings, maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.***
  - 1.7 ***Deliver tools, spare parts, extra stock, and similar items.***
  - 1.8 ***Demonstration, through operation and testing, the functions of all systems and/or equipment to the satisfaction of the Owner for compliance to the contract. Complete testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.***
  - 1.9 ***Complete final cleanup requirements, including touchup painting.***
  - 1.10 ***Touch up and otherwise repair and restore marred, exposed finishes.***
  - 1.11 ***Compliance with other terms as outlined in the Contract Documents.***
  - 1.12 ***List of all the General Contractor's suppliers, sub-contractors, etc. Include name of firm, address, FEIN number and CT Tax I.D. number.***
2. **Inspection Procedures:** The General Contractor shall be ready and prepared when they request a Substantial Completion inspection. If the inspection reveals that the work is not complete, there are extensive punchlist items and as the items listed above are not complete, the Construction Administrator, Owner, and Agency will determine the inspection has failed.

3. The General Contractor is responsible for all costs to re-inspect due to a failed inspection.
  - 3.1 The General Contractor will repeat inspection when requested and assured that the Work is substantially complete.
  - 3.2 Results of the completed inspection will form the basis of requirements for Acceptance of the Work.

**C. Acceptance of the Work**

1. **Preliminary Procedures:** Before requesting a Final Inspection and Certificate of Acceptance and Final Payment, complete the following. List exceptions in the request.
  - 1.1 Submit a request for the Final Inspection and Certificate of Acceptance, with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
  - 1.2 Submit a certified copy of the Engineer's Final Inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
  - 1.3 Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
  - 1.4 Submit consent of surety to Final Payment.
  - 1.5 Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- D. Reinspection Procedure:** The Inspection Group will re-inspect the Work upon receipt of notice from the Construction Administrator that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Owner.

1. Upon completion of re-inspection, the Construction Administrator will prepare a Certificate of Acceptance for issuance by the Owner. If the Work is incomplete, the Construction Administrator will advise the General Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for Acceptance.

- E.** Issuance of a Certificate of Acceptance, in accordance with CGS § 4-61(b)(2) as amended, by the Owner does not alter the responsibility of the General Contractor to complete all Work in accordance with the Contract Documents.

**F. General Contractor's As-Built Drawings Submittal:**

1. **General:** The General Contractor shall not use the As-Built Drawings for construction purposes. Protect General Contractor's As-Built Drawings from deterioration and loss in a secure, fire-resistant location. Provide access to the As-Built Drawings for Owner's and Construction Administrator's reference during normal working hours. Keep documents current; do not permanently conceal any work until required information has been recorded. Failure to keep documents current is sufficient cause to withhold progress payments.

- 2. General Contractor's As-Built Drawings:** The General Contractor shall maintain one clean, complete undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. **Failure to keep As-built Documents current is sufficient cause to withhold progress payments.**
- 2.1** Mark record sets with erasable pencil to distinguish between variations in separate categories of the Work.
  - 2.2** Mark all new information that is not shown on Contract Drawings.
  - 2.3** Note related Agreement Amendments where applicable.
  - 2.4** Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
  - 2.5** Upon completion of the work, the General Contractor shall submit Record Drawings to the Construction Administrator for the Owner's Records who will pass them on to the Architect or Engineer for transferring the changes to the Record Drawing Mylar Tracings.
  - 2.6** Submit electronic format data of all Coordination Drawing drawings as required by the owner.
  - 2.7** Refer to Section **01 45 00 "Quality Control"** Paragraph **8.3.6** for required as-built drawings and specifications for fire alarm systems.
  - 2.8** Upon completion of the work, the General Contractor shall submit Record Drawings to the Architect and/or Engineer for transferring the changes to the Record Drawings.
- G. General Contractor's Record Documents:** Within **thirty (30)** Calendar Days after receipt of the General Contractor's "As-Built Drawings" the Architect/Engineers shall convert the General Contractor "As-Built" information into an electronic CADD format as required by the Owner, using the original Architect/Engineer contract documents as base drawings. The Architect shall produce "Record Documents" that show all of the significant modifications made during the course of the project.. The Architect's shall produce **two (2)** sets of electronic CADD format "Record Documents" on electronic media as required by the Owner and (1) set of reproducible Mylar's "Record Documents". The original Mylar "Cover Sheet" that includes the original Architect/Engineer Team Members dated signatures and professional seals shall be the Record Documents Cover Sheet. The Architect's final "Record Documents" (electronic media and reproducible Mylar's) shall be made at the Architect's expense and shall become the property of the State.
- H. General Contractor's As-Built Product Data:** The General Contractor shall maintain one copy of each As-Built Product Data submittal and a markup of record drawings and As-Built Specifications.
- 1.** Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
  3. Upon completion of markup, submit complete set of As-Built Product Data to the Construction Administrator for the Owner's records.
  4. The Architect and Engineers will be responsible for the accuracy of As-Built Drawings.
- I. **General Contractor's Miscellaneous Record Submittals:** Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Construction Administrator for the Owner's records.
- J. **Maintenance Manuals:** Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, *2-inch, 3-ring*, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder according to Section **01 78 23 "Operation and Maintenance Data"**. The manual shall include, but not be limited to, the following types of information:
1. **Emergency instructions.**
  2. **Spare parts list.**
  3. **Copies of warranties.**
  4. **Wiring diagrams.**
  5. **Recommended "turn-around" cycles.**
  6. **Inspection procedures.**
  7. **Shop Drawings and Product Data.**
  8. **List of vendors and addresses.**
- K **Closeout Procedures:**
1. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Agency's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
    - 1.1 **Maintenance manuals.**
    - 1.2 **Record documents.**
    - 1.3 **Spare parts and materials.**
    - 1.4 **Tools.**
    - 1.5 **Lubricants.**
    - 1.6 **Identification systems.**
    - 1.7 **Control sequences.**
    - 1.8 **Hazards.**
    - 1.9 **Cleaning.**
    - 1.10 **Warranties and bonds.**

- 1.11 Maintenance agreements and similar continuing commitments.**
2. As part of instruction for operating equipment, demonstrate the following procedures:
- 2.1 Startup.**
  - 2.2 Shutdown.**
  - 2.3 Emergency operations.**
  - 2.4 Noise and vibration adjustments.**
  - 2.5 Safety procedures.**
  - 2.6 Economy and efficiency adjustments.**
  - 2.7 Effective energy utilization.**

**N. Final Cleaning:**

1. **General:** The Contract Documents require general cleaning during construction. Regular site cleaning is included in **Section 01 74 13 "Progress Cleaning"**.
2. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion and Certification of Occupancy.
4. **Exterior:**
  - 4.1 Clean the roof and site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth, even-textured surface.
  - 4.2 Clean exposed exterior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances
  - 4.3 Clean roofs, gutters and downspouts.
  - 4.4 Remove waste and surplus materials, rubbish and construction equipment and facilities from the site, and deposit it legally elsewhere.
  - 4.5 Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Remove paint spots; wash and polish glass.
5. **Pest Control:** Engage an experienced, licensed exterminator to make a final inspection and rid the work of rodents, insects, and other pests.
6. **Removal of Protection:** Remove temporary protection and facilities installed for protection of the Work during construction.
7. **Compliance:** Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Agency's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

- 7.1 Where extra materials of value remain after completion of associated Work, they become the Agency's property. Dispose of these materials as directed by the Construction Administrator.
- 7.2 Leave building clean and ready for occupancy. If the Design Builder fails to clean up, the Owner may do so, with the cost charged to the Developer.

**O. Prerequisites To Functional Completion**

- 1. All TAB work and the commissioning of systems must be complete prior to Functional Completion, unless approved in writing by the DCS Project Manager. Exceptions to this are the planned control system training performed after occupancy and any required seasonal or approved deferred testing. This includes for all systems, but is not limited to:
  - 1.1 Completed and signed start-up and prefunctional checklist documentation;
  - 1.2 Requested trend log data;
  - 1.3 Submission of final approved TAB report;
  - 1.4. Completion of all functional testing;
  - 1.5 Required training of Owner personnel completed and approved;
  - 1.6 Submission of the approved O&M manuals;
  - 1.7 All identified deficiencies have been corrected or are approved by the Owner to be accepted from this milestone.
- 2. The DCS Project Manager and Construction Administrator will determine the date of Functional Completion.

**01 78 23 OPERATION AND MAINTENANCE DATA**

- A. **Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. **Summary:** This Section includes administrative and procedural requirements for operation and maintenance manuals, including the following:
  - 1. Preparing and submitting operation and maintenance manuals for building operating systems and equipment.
  - 2. Preparing and submitting instruction manuals covering the care, preservation, and maintenance of architectural products and finishes.
- C. **Related Sections:** The following sections contain requirements that relate to this Section:
  - 1. Division 01 Section **01 33 00 "Submittal Procedures"** specifies preparation of Shop Drawings and Product Data.
  - 2. Division 01 Section **01 75 00 "Starting and Adjusting"** specifies instruction of the Owner and Agency operating personnel in the operation and maintenance of building systems and equipment and the general requirements for starting-up equipment and systems.
  - 3. Division 01 Section **01 77 00 "Closeout Procedures"** specifies general closeout requirements.
  - 4. Division 01 Section **01 78 30 "Warranties and Bonds"** specifies requirements for submittal of warranties and bonds.

5. Appropriate Sections of the Divisions 02 through 49 specify special operation and maintenance data requirements for specific pieces of equipment or building operating systems.

**D. Quality Assurance**

1. **Maintenance Manual Preparation:** In preparation of maintenance manuals, use personnel thoroughly trained and experienced in operation and maintenance of equipment or system involved.
  - 1.1 Where maintenance manuals require written instructions, use personnel skilled in technical writing where necessary for communication of essential data.
  - 1.2 Where maintenance manuals require drawings or diagrams, use draftsmen capable of preparing drawings clearly in an understandable format.
2. **Instructions for the Owner and Agency Personnel:** The Contractor must use experienced instructors thoroughly trained and experienced in operation and maintenance of equipment or system involved, to instruct the Owner's operation and maintenance personnel.

**E. Submittals:**

1. **Submittal Schedule:** Comply with the following schedule for submitting operation and maintenance manuals:
  - 1.1 Before Substantial Completion, when each installation that requires operation and maintenance manuals is nominally complete, submit **two (2)** draft copies of each manual to the Construction Administrator for review. Include a complete index or table of contents of each manual.
    - 1.1.1 The Construction Administrator will return **one (1)** copy of the draft with comments within **twenty-one (21)** Calendar Days of receipt.
    - 1.1.2 Submit **three (3)** copies of data in final form at least **twenty (21)** Calendar Days before final inspection. The Construction Administrator will return **one (1)** copy within **twenty (21)** Calendar Days after final inspection, with comments.
  2. After final inspection, make corrections or modifications to comply with the Architect's comments. Submit final copies to the Construction Administrator within **twenty (21)** Calendar Days of receipt of the Architect's comments.
  3. **Form of Submittal:** Prepare operation and maintenance manuals in the form of an instructional manual for use by the Owner's operating personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder.
  4. **Binders:** For each manual, provide heavy-duty, commercial-quality, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to receive **8-1/2-by-11- inch** paper. Provide a clear plastic sleeve on the spine to hold labels describing contents. Provide pockets in the covers to receive folded sheets.
    - 4.1 Where **two (2)** or more binders are necessary to accommodate data, correlate data in each binder into related groupings according to the Project Manual table of contents. Cross-reference other binders

where necessary to provide essential information for proper operation or maintenance of the piece of equipment or system.

- 4.2 Identify each binder on front and spine, with the printed title "**OPERATION AND MAINTENANCE MANUAL**", Project title or name, and subject matter covered. Indicate volume number for multiple volume sets of manuals.
5. **Dividers:** Provide heavy paper dividers with celluloid-covered tabs for each separate section. Mark each tab to indicate contents. Provide a typed description of the product and major parts of equipment included in the section on each divider.
6. **Protective Plastic Jackets:** Provide protective, transparent, plastic jackets designed to enclose diagnostic software for computerized electronic equipment.
7. **Text Material:** Where maintenance manuals require written material, use the manufacturer's standard printed material. If manufacturer's standard printed material is not available, provide specially prepared data, neatly typewritten, on **8-1/2-by-11-inch, 20-lb/sq ft** white bond paper.
8. **Drawings:** Where maintenance manuals require drawings or diagrams, provide reinforced, punched binder tabs on drawings and bind in with text.
  - 8.1 Where oversize drawings are necessary, fold drawings to the same size as text pages and use as a foldout.
  - 8.2 If drawings are too large to be used practically as a foldout, place the drawing, neatly folded, in front or rear pocket of binder. Insert a typewritten page indicating drawing title, description of contents, and drawing location at the appropriate location in the manual.

**F. Manual Content**

1. In each manual include information specified in the individual Specification Section and the following information for each major component of building equipment and its controls:
  - 1.1 **General system or equipment description.**
  - 1.2 **Design factors and assumptions.**
  - 1.3 **Copies of applicable shop drawings and product data.**
  - 1.4 **System or equipment identification, including:**
    - 1.4.1 **Name of manufacturer.**
    - 1.4.2 **Model number.**
    - 1.4.3 **Serial number of each component.**
  - 1.5 **Operating instructions.**
  - 1.6 **Emergency instructions.**
  - 1.7 **Wiring diagrams.**
  - 1.8 **Inspection and test procedures.**
  - 1.9 **Maintenance procedures and schedules.**
  - 1.10 **Precautions against improper use and maintenance.**
  - 1.11 **Copies of warranties.**
  - 1.12 **Repair instructions including spare parts listing.**



**1.13 Sources of required maintenance materials and related services.**

**1.14 Manual index.**

2. Organize each manual into separate sections for each piece of related equipment. As a minimum, each manual shall contain a title page; a table of contents; copies of product data, supplemented by drawings and written text; and copies of each warranty, bond, and service contract issued.
  - 2.1 **Title Page:** Provide a title page in a transparent, plastic envelope as the first sheet of each manual. Provide the following information:
    - 2.1.1 **Subject matter covered by the manual.**
    - 2.1.2 **Name and address of the Project.**
    - 2.1.3 **Date of submittal.**
    - 2.1.4 **Name, address, and telephone number of the Contractor.**
    - 2.1.5 **Name and address of the Architect and Construction Administrator.**
    - 2.1.6 **Cross-reference to related systems in other operation and maintenance manuals.**
  - 2.2 **Table of Contents:** After title page, include a typewritten table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product included, identified by product name or other appropriate identifying symbol and indexed to the content of the volume.
    - 2.2.1 Where a system requires more than one volume to accommodate data, provide a comprehensive table of contents for all volumes in each volume of the set.
  - 2.3 Provide a general information section immediately following table of contents, listing each product included in the manual, identified by product name. Under each product, list the name, address, and telephone number of the subcontractor or Installer and the maintenance contractor. Clearly delineate the extent of responsibility of each of these entities. Include a local source for replacement parts and equipment.
  - 2.4 **Product Data:** Where the manuals include manufacturer's standard printed data, include only sheets that are pertinent to the part or product installed. Mark each sheet to identify each part or product included in the installation. Where the Project includes more than **one (1)** item in a tabular format, identify each item, using appropriate references from the Contract Documents. Identify data that is applicable to the installation, and delete references to information that is not applicable.
  - 2.5 **Written Text:** Prepare written text to provide necessary information where manufacturer's standard printed data is not available, and the information is necessary for proper operation and maintenance of equipment or systems. Prepare written text where it is necessary to provide additional information or to supplement data included in the manual. Organize text in a consistent format under separate headings for different procedures. Where necessary, provide a

logical sequence of instruction for each operation or maintenance procedure.

**2.6 Drawings:** Provide specially prepared drawings where necessary to supplement manufacturer's printed data to illustrate the relationship of component parts of equipment or systems or to provide control or flow diagrams. Coordinate these drawings with information contained in project record drawings to assure correct illustration of the completed installation.

**2.6.1** Do not use original Record Documents as part of operation and maintenance manuals.

**2.7 Warranties and/or Bonds:** Provide a copy of each warranty and/or bond in the appropriate manual for the information of the Owner's operating personnel. Provide written data outlining procedures to follow in the event of product failure. List circumstances and conditions that would affect validity of warranty or bond.

**G. Material And Finishes Maintenance Manual:**

1. Submit **four (4)** copies of each manual, in final form, on material and finishes to the Construction Administrator for distribution. Provide **one (1)** section for architectural products, including applied materials and finishes. Provide a second section for products designed for moisture protection and products exposed to the weather.

**1.1** Refer to individual Specification Sections for additional requirements on care and maintenance of materials and finishes.

2. **Moisture Protection and Products Exposed to the Weather:** Provide complete manufacturer's data with instructions on inspection, maintenance, and repair of products exposed to the weather or designed for moisture-protection purposes.

**3.1 Manufacturer's Data:** Provide manufacturer's data giving detailed information, including the following, as applicable:

**3.1.1 Applicable standards.**

**3.1.2 Chemical composition.**

**3.1.3 Installation details.**

**3.1.4 Inspection procedures.**

**3.1.5 Maintenance information.**

**3.1.6 Repair procedures.**

**H. Equipment And Systems Maintenance Manual:**

1. Submit **four (4)** copies of each manual, in final form, on equipment and systems to the Construction Administrator for distribution. Provide separate manuals for each unit of equipment, each operating system, and each electric and electronic system.

**1.1** Refer to individual Specification Sections for additional requirements on operation and maintenance of the various pieces of equipment and operating systems.

2. **Equipment and Systems:** Provide the following information for each piece of equipment, each building operating system, and each electric or electronic system.

- 2.1 **Description:** Provide a complete description of each unit and related component parts, including the following:
  - 2.1.1 **Equipment or system function.**
  - 2.1.2 **Operating characteristics.**
  - 2.1.3 **Limiting conditions.**
  - 2.1.4 **Performance curves.**
  - 2.1.5 **Engineering data and tests.**
  - 2.1.6 **Complete nomenclature and number of replacement parts.**
- 2.2 **Manufacturer's Information:** For each manufacturer of a component part or piece of equipment, provide the following:
  - 2.2.1 **Printed operation and maintenance instructions.**
  - 2.2.2 **Assembly drawings and diagrams required for maintenance.**
  - 2.2.3 **List of items recommended to be stocked as spare parts.**
- 2.3 **Maintenance Procedures:** Provide information detailing essential maintenance procedures, including the following:
- 2.4 **Operating Procedures:** Provide information on equipment and system operating procedures, including the following:
  - 2.4.1 **Startup procedures.**
  - 2.4.2 **Equipment or system break-in.**
  - 2.4.3 **Routine and normal operating instructions.**
  - 2.4.4 **Regulation and control procedures.**
  - 2.4.5 **Instructions on stopping.**
  - 2.4.6 **Shutdown and emergency instructions.**
  - 2.4.7 **Summer and winter operating instructions.**
  - 2.4.8 **Required sequences for electric or electronic systems.**
  - 2.4.9 **Special operating instructions.**
- 2.5 **Servicing Schedule:** Provide a schedule of routine servicing and lubrication requirements, including a list of required lubricants for equipment with moving parts.
- 2.6 **Controls:** Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.
- 2.7 **Identification Drawings:** Provide each Contractor's Identification Drawings.
  - 2.7.1 Provide as-installed, color-coded, piping diagrams, where required for identification.
- 2.8 **Valve Tags:** Provide charts of valve-tag numbers, with the location and function of each valve.

**2.9 Circuit Directories:** For electric and electronic systems, provide complete circuit directories of panel boards, including the following:

**2.9.1 Controls.**

**3. Electronic Media:**

**3.1** For equipment which requires maintenance by operational personnel, provide a professionally developed **DVD** for the use of maintenance training for the facility. Each **DVD** will be accompanied by a written index which can be utilized to find any specific item of information by time or place on the **DVD**.

**3.2** The General Contractor is responsible for this production. This **DVD** will be provided to the Construction Administrator at the same time as the delivery of the other maintenance material.

**3.3** The **DVD** must be able to be edited for future changes to the equipment and modifications as they occur.

**01 78 30 WARRANTIES AND BONDS**

- A. Related Documents:** Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Summary:** This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
1. Refer to the General Conditions for terms of the General Contractor's period for correction of the Work.
- C. Related Sections:** The following Sections contain requirements that relate to this Section:
1. Division 01 Section **01 33 00 "Submittal Procedures"** specifies procedures for submitting warranties.
  2. Division 01 **Section 01 77 00 "Closeout Procedures"** specifies contract closeout procedures.
  3. Division 01 **Section 01 78 23 "Operation and Maintenance Data"** specifies required operation and maintenance data.
  4. The Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.
  5. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- D. Disclaimers and Limitations:** Manufacturer's disclaimers and limitations on product warranties do not relieve the General Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve the suppliers, manufacturers, and subcontractors required to countersign special warranties with the General Contractor.
- E. Related Damages and Losses:** When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- F. Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written

endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

- G. Replacement Cost:** Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The General Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- H. Owner's Recourse:** Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - 1. Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- I.** Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the General Contractor presents evidence that entities required to countersign such commitments are willing to do so.
- J.** The General Contractor shall warranty all materials and workmanship for a period of **eighteen (18)** from the date of Substantial Completion. In addition, the Contractor shall furnish the warranties listed below. Submit four copies of each to the Architect in the supplier's standard form or in the form given below if there is no standard form available.
- K.** The General Contractor shall warranty all materials and workmanship for a period of **eighteen (18)** months from the date of Substantial Completion. In addition, the General Contractor shall furnish the warranties listed below. Submit four copies of each to the Architect in the supplier's standard form or in the form given below if there is no standard form available.
- L. Specification/Warranty Table:** The General Contractor shall provide for all warranties as shown in the Specification/Warranty table:

<b>Specification / Warranty Table</b>		
Item No.	Section No.	Specification Product/Warranty
2.	05	<u>Insert</u> <b>Expansion Joint Covers:</b> 5 year material & workmanship.
3.	07	<u>Insert</u> <b>Single-Ply Membrane Roofing, Base Flashing and Insulation:</b> 10 year unlimited, materials and installation, and; 15 year material and workmanship, and; 2 year General Contractor's warranty for installation.
4.	07	<u>Insert</u> <b>Built Up Roofing (BUR), Base Flashing, and Insulation:</b> 20 year material and workmanship, and; 2 General Contractor's warranty for installation.
8.	07	<u>Insert</u> <b>Waterproofing:</b> 5 year material and workmanship.
12.	07	<u>                    </u> <b>Exterior - Interior Caulking and Sealants:</b> 5 year, material and workmanship.

Specification / Warranty Table		
Item No.	Section No.	Specification Product/Warranty
29	22	<b>Water Softener:</b> 10 years, material, and installation.
32	23	<b>Compressors and Pumps:</b> 5 years, material and installation,

- M. Submit certification that finish materials are fire rated as specified.
- N. Form of Warranty: Warranties shall be submitted in following format:

**Warranty**

**Commissioner:** *(Insert Commissioner's Name)*  
**Department of Administrative Services**  
**Division of Construction Services**  
**165 Capitol Avenue**  
**Hartford, Connecticut 06106**

**Project Number:** *(Insert DCS Project Number)*  
**Project Title:** *(Insert Project Title)*

**I (We) hereby warranty**

**the \_\_\_\_\_ work on the referenced project for a \_\_\_\_\_ years**  
**period of \_\_\_\_\_**

**from \_\_\_\_\_, 20 \_\_\_\_\_ against failures of workmanship and materials in accordance**  
**with the requirements of \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, of the Specifications.**  
**Section \_\_\_\_\_, Page \_\_\_\_\_, Paragraph \_\_\_\_\_**

**Installer  | Subcontractor  | Vendor/Suppliers  | Manufacturer**

**Installer or Subcontractor or  
Vendor/Suppliers or Manufacturer Name:** \_\_\_\_\_

**Installer or Subcontractor or  
Vendor/Suppliers or Manufacturer  
Signature:** \_\_\_\_\_

**General Contractor's Name** \_\_\_\_\_

**General Contractor's Signature:** \_\_\_\_\_

**or**

**General Contractor's  
Authorized Agent Signature:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- O.** Bonds shall be by approved Surety Companies, made out to the Commissioner, Department of Administrative Services on companies' standard form.
- P.** Warranties, Guarantees, or bonds supplied by the General Contractor's Subcontractors or Vendors/Suppliers or Manufacturers shall reference the project name, number, and location and be certified by the General Contractor to be for the product and installation on the project and must be countersigned by the General Contractor.
- Q. Submittals:**
  - 1.** Submit written warranties prior to the date certified for Substantial Completion. If the General Contractor's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner.
  - 2.** Forms for special warranties are included in this Section. Prepare a written document utilizing the appropriate form, ready for execution by the General Contractor's, and by the General Contractor's subcontractor or vendor/supplier, or manufacturer. Submit a draft to the Owner, through the Construction Administrator, for approval prior to final execution.
    - 2.1** Refer to the Divisions 02 through 48 Sections for specific content requirements and particular requirements for submitting special warranties.
    - 4.3** When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

**End**

**Section 01 70 00  
Execution and Closeout Procedures**



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 general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
  - 1. Motor controllers.
  - 2. Torque, speed, and horsepower requirements of the load.
  - 3. Ratings and characteristics of supply circuit and required control sequence.
  - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.

2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Efficiency: Energy and premium efficient, as defined in NEMA MG 1.
  - 1. "Energy Efficient" for all motors less than 1 HP.
  - 2. "Premium Efficient" for all motors 1 HP and larger, including those furnished as part of equipment specified in equipment sections. The contractor shall confirm utility company

minimum requirements for incentive programs and provide motors with efficiencies that meet or exceed the most stringent between NEMA MG-1 and utility company incentive program requirements. The contractor, at no extra charge to the Owner, shall replace any motor that does not meet the utility company's incentive program. The efficiency and/or "NEMA Premium Efficiency" shall be displayed on the motor nameplate and clearly indicated on the equipment shop drawings submitted for approval.

- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
  - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
  - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Multispeed Motors: Separate winding for each speed.
- F. Rotor: Random-wound, squirrel cage.
- G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- H. Temperature Rise: Match insulation rating.
- I. Insulation: Class F.
- J. Code Letter Designation:
  - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
  - 2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.
- L. Motor Controllers:
  - 1. Motor controllers, including variable frequency controllers, shall be furnished with the motor and per Division 26.
  - 2. Overload Protection: Overload protection shall be sized and furnished for the requirements of the specific application.
  - 3. Accessories: Provide accessories coordinated to the specific application and per Division 26.

#### 2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
3. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
4. Shaft Voltage and Bearing Current Protection: Shaft Grounding Rings (SGR) as manufactured by AEGIS or equivalent installed per manufacturer's recommendations and in accordance with NEMA MG1 31.4.4.3 to discharge voltages and divert current to protect bearings in attached equipment.

### PART 3 - EXECUTION

#### 3.1 MOTORS USED WITH VARIABLE FREQUENCY CONTROLLERS

- A. Install shaft grounding rings on all equipment motors using variable speed controllers.
- B. Install per manufacturer's instructions.
- C. Assure grounding of SGR to motor frame.

END OF SECTION 230513  
08/19/2016

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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:
  - 1. Sleeves.
  - 2. Sleeve-seal systems.
  - 3. Pipe roof penetration seal assembly system.
  - 4. Grout.

### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

## PART 2 - PRODUCTS

### 2.1 SLEEVES

- A. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
  - 1. Provide sleeves with tabs in fire-resistant walls for securing sleeve to assembly being penetrated.

### 2.2 PIPE ROOF PENETRATION SEAL ASSEMBLY SYSTEM

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. Pate Company.
  - 2. RPS.
- C. Description: Manufactured, one piece spun aluminum base, graduated step PVC boot, adjustable stainless steel clamps, storm collar, suitable for installation in existing roof construction. Include clamping ring, bolts, and nuts for membrane flashing.

## 2.3 SLEEVE-SEAL SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Advance Products & Systems, Inc.
  2. CALPICO, Inc.
  3. Metraflex Company (The).
  4. Pipeline Seal and Insulator, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: Interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
    - a. EPDM (-40 to 250 Deg F): Standard service applications.
    - b. Nitrite (-40 to 250 Deg F): Hydro carbon service applications.
    - c. Silicon (-67 to 400 Deg F): High temperature or fire seal applications.
  2. Pressure Plates: Plastic. Include two for each sealing element.
  3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements. Include one for each sealing element.

## 2.4 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in partitions, roofs, and walls.
- B. Sleeves shall be fastened securely to the assembly that it penetrates.
- C. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough per sleeve seal manufacturer's recommendations to provide minimum 1-inch annular clear space between piping and concrete slabs and walls.
1. Sleeves are not required for core-drilled holes, except where roof penetration, mechanical spaces or wet areas are above finished areas.

- D. Install sleeves in concrete roof slabs.
  - 1. Cut sleeves to length for mounting flush with both surfaces.
    - a. Exception: Extend sleeves installed in roof penetration, floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Penetration shall be made completely watertight.
  - 2. Using grout, seal the space outside of sleeves in slab.
- E. Install sleeves for pipes passing through interior partitions.
  - 1. Cut sleeves to length for mounting flush with both surfaces.
  - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
  - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.
- F. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

### 3.2 PIPE ROOF PENETRATION SEAL ASSEMBLY INSTALLATION

- A. Install per manufacturer recommendations, compatible with existing roof construction.
- B. Provide storm collar and flashing and roof cut and patching for a completely weatherproof and waterproof seal.

### 3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior roof piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

### 3.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
  - 1. Concrete Roof Slabs Penetration:
    - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
      - 1) Provide sleeve seals where sleeves are located in roof penetrations over finished spaces.
      - 2) Provide pipe roof penetration seal assembly system at existing roof penetration.

2. Interior Partitions:
  - a. Piping Smaller Than NPS 6: Galvanized-steel-sheet sleeves.

END OF SECTION 230517  
08/19/2016



## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section Includes:

- 1. Test plugs.

### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

## PART 2 - PRODUCTS

### 2.1 TEST PLUGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Flow Design, Inc.
  - 2. Peterson Equipment Co., Inc.
  - 3. Trerice, H. O. Co.
  - 4. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
  - 5. Weiss Instruments, Inc.
- B. Description: Test-station fitting made for insertion into piping tee fitting.
- C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- D. Thread Size: NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe thread.
- E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- F. Core Inserts: EPDM self-sealing rubber.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install test plugs in piping tees.

B. Install test plugs in the following locations:

1. Inlet and outlet of cooling tower.

### 3.2 CONNECTIONS

A. Install test plugs adjacent to equipment to allow testing, service and maintenance with gages, thermometers, and probes.

END OF SECTION 230519

08/19/2016

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following hangers and supports for HVAC system piping and equipment:
  - 1. Steel pipe hangers and supports.
  - 2. Trapeze pipe hangers.
  - 3. Metal framing systems.
  - 4. Thermal-hanger shield inserts.
  - 5. Fastener systems.
  - 6. Equipment supports.
- B. Related Sections include the following:
  - 1. Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment" for vibration isolation devices.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
- B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Design seismic-restraint hangers and supports for piping and equipment.

1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Steel pipe hangers and supports.
  - 2. Thermal-hanger shield inserts.
  - 3. Powder-actuated fastener systems.

- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
  - 1. Trapeze pipe hangers. Include Product Data for components.
  - 2. Metal framing systems for pipe support. Include Product Data for components.
  - 3. Pipe stands. Include Product Data for components.
  - 4. Equipment supports.
- C. Welding certificates.

## 1.6 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1, "Structural Welding Code--Steel."
  - 2. AWS D1.2, "Structural Welding Code--Aluminum."
  - 3. AWS D1.3, "Structural Welding Code--Sheet Steel."
  - 4. AWS D1.4, "Structural Welding Code--Reinforcing Steel."
  - 5. ASME Boiler and Pressure Vessel Code: Section IX.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
  - 1. AAA Technology & Specialties Co., Inc.
  - 2. Anvil, Inc.
  - 3. Bergen-Power Pipe Supports.
  - 4. B-Line Systems, Inc.; a division of Cooper Industries.
  - 5. Carpenter & Paterson, Inc.
  - 6. Empire Industries, Inc.
  - 7. ERICO/Michigan Hanger Co.
  - 8. Globe Pipe Hanger Products, Inc.
  - 9. GS Metals Corp.
  - 10. National Pipe Hanger Corporation.
  - 11. PHD Manufacturing, Inc.
  - 12. PHS Industries, Inc.
  - 13. Piping Technology & Products, Inc.

14. Tolco Inc.

- C. Galvanized, Metallic Coatings: Hot dipped after fabrication (ASTM A 123 and ASTM A 153).
- D. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

### 2.3 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

### 2.4 METAL FRAMING SYSTEMS

- A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

B. Manufacturers:

1. Anvil, Inc.
2. B-Line Systems, Inc.; a division of Cooper Industries.
3. ERICO/Michigan Hanger Co.; ERISTRUT Div.
4. GS Metals Corp.
5. Power-Strut Div.; Tyco International, Ltd.
6. Thomas & Betts Corporation.
7. Tolco Inc.
8. Unistrut Corp.; Tyco International, Ltd.

- C. Coatings: Hot dipped galvanized after fabrication (ASTM A 123 and ASTM A 153).

### 2.5 THERMAL-HANGER SHIELD INSERTS

- A. Description: 100-psig- minimum, compressive-strength insulation insert encased in sheet metal shield.

B. Manufacturers:

1. ERICO/Michigan Hanger Co.
2. PHS Industries, Inc.
3. Pipe Shields, Inc.
4. Rilco Manufacturing Company, Inc.
5. TOLCO Inc.
6. Value Engineered Products, Inc.

- C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier.

- D. Insulation-Insert Material for Hot Condenser Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

- E. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

- F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- G. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

## 2.6 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used. Verify suitability for use in lightweight concrete slabs, existing pre-tensioned concrete panels and all slabs less than 4 inches thick with Structural Engineer.
  - 1. Manufacturers:
    - a. Hilti, Inc.
    - b. ITW Ramset/Red Head.
    - c. Powers Fasteners.
  - B. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated or stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
    - 1. Manufacturers:
      - a. Hilti, Inc.
      - b. ITW Ramset/Red Head.
      - c. Powers Fasteners.

## 2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

## 2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
  - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.

## PART 3 - EXECUTION

### 3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with hot dipped galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
  - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F pipes, NPS 4 to NPS 16, requiring up to 4 inches of insulation.
  - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24, requiring clamp flexibility and up to 4 inches of insulation.
  - 4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24, if little or no insulation is required.
  - 5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
  - 6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated stationary pipes, NPS 3/4 to NPS 8.
  - 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
  - 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
  - 9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2.
  - 10. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
  - 11. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
  - 12. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
  - 13. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20, from single rod if horizontal movement caused by expansion and contraction might occur.
  - 14. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42, if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
  - 15. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24, if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
- G. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

2. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  3. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  4. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  5. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
  6. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
  7. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
  8. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
  9. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
  10. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  11. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  12. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
  13. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- H. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Pipe-Covering Protection Saddles (MSS Type 39): For supporting insulated pipe without vapor barrier, fill interior voids with insulation that matches adjoining insulation.
  2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
  3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- I. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, provide per Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment".
- J. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- K. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- L. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction. Verify suitability for use in lightweight concrete slabs and all slabs less than 4 inches thick.



### 3.2 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
  - 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
- D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
  - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
  - 3. Verify suitability of fasteners in lightweight concrete slabs and all concrete slabs less than 4 inches thick.
- F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- K. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.
- M. Insulated Piping: Comply with the following:
  - 1. Attach clamps and spacers to piping.
    - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
    - c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.
  - 2. Install MSS SP-58, Type 39, galvanized protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
    - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
  - 3. Install MSS SP-58, Type 40, galvanized protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees or per thermal hanger insert manufacturer's recommendations.
    - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
  - 4. Shield Dimensions for Pipe: Not less than the following or per thermal hanger insert manufacturer's recommendations:
    - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
    - b. NPS 4: 12 inches long and 0.06 inch thick.
    - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
    - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
  - 5. Pipes NPS 8 and Larger: Include wood inserts.
  - 6. Insert Material: Length at least as long as protective shield.
  - 7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

### 3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.6 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 230529  
08/19/2016

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## PART 1 - GENERAL

### 1.1 INTENT

- A. It is the intent of this Specification to provide the basis of design for the vibration isolation, accommodation of differential seismic motion across building expansion/seismic joints, and seismic restraints on all HVAC systems. The term "SYSTEMS" applies to all equipment, piping, and ductwork on the project. The following specification provides a requirement for the attachment of all non-structural components to the structure.

### 1.2 RELATED DOCUMENTS

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

### 1.3 SUMMARY

- A. This Section includes the following:
  - 1. Isolation pads.
  - 2. Spring hangers with vertical-limit stops.
  - 3. Seismic snubbers.
  - 4. Restraining braces and cables, and end connection fastening devices.
  - 5. Building expansion/seismic joint accommodation equipment.

### 1.4 DEFINITIONS

- A. IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning and Development for the State of California.

### 1.5 PERFORMANCE REQUIREMENTS

- A. Comply with seismic restraint requirements in accordance with state and local codes and ordinances and the authority having jurisdiction.
- B. Determine the following, but not limited to, design criteria conditions for the project location required in accordance with all state and local codes and ordinances. Where codes do not reference criteria, refer to the latest "ASHRAE HVAC APPLICATIONS" Handbook. Include criteria with code references in shop drawing submittal.
  - 1. Wind-Restraint Loading:
    - a. Basic Wind Speed: 95.
    - b. Building Classification Category: IV.

- c. Minimum 10 lb/sq. ft. multiplied by the maximum area of the HVAC component projected on a vertical plane that is normal to the wind direction, and 45 degrees either side of normal.
2. Seismic-Restraint Loading:
- a. Site Class as Defined in the IBC: D.
  - b. Assigned Building Classification Category as Defined in the IBC: IV.
    - 1) Component Importance Factor: 1.5 for life safety systems, components with hazardous content and components required for continued operation in Seismic Use Group III structures; 1.0 for all other components.
    - 2) Component Response Modification Factor: As determined by seismic/wind engineer.
    - 3) Component Amplification Factor: As determined by the seismic/wind engineer.
  - c. Design Spectral Response Acceleration at Short Periods (0.2 Second): 25.4 percent.
  - d. Design Spectral Response Acceleration at 1-Second Period: 9.9 percent.
  - e. Seismic Design Category: C; HVAC components with Importance Factor ( $I_p$ ) = 1.5 require seismic bracing, but components with  $I_p$  = 1.0 are exempt from requirements for seismic bracing.
  - f. Owner's Project Requirements: All equipment to be an importance factor of 1.5 and seismically restrained per this Section.

#### 1.6 SUBMITTALS

- A. Product Data: For the following:
- 1. Include detailed type, style, materials, rated load, rated deflection, and overload capacity for each vibration isolation device.
  - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
    - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an evaluation service member of ICC-ES, OSHPD or an independent agency acceptable to authorities having jurisdiction.
    - b. Annotate to indicate application of each product submitted and compliance with requirements.
  - 3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.
- B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation and registered in the state of the project. Provide submittal in two parts - the first part to address all of the equipment on the project prior to installation, and the second to address seismic bracing of piping and ductwork after final routing has been determined.

1. Seismic Code Summary: Written summary of applicable codes, references and criteria specific to the project.
  2. List of all HVAC equipment and systems with annotation of where seismic anchoring and bracing is applicable. If a particular component is exempt due to the conditions of the project, it shall be so stated.
  3. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic and wind forces required to select vibration isolators, seismic and wind restraints, and for designing vibration isolation bases and expansion/seismic joint accommodation.
    - a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Division 22 Sections for equipment mounted outdoors.
  4. Seismic- and Wind-Restraint Details:
    - a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.
    - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
    - c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Division 22 Sections for equipment mounted outdoors.
    - d. Preapproval and Evaluation Documentation: By an evaluation service member of ICC-ES, OSHPD or an independent agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
  5. Building Expansion/Seismic Joint Accommodation Details: Detail fabrication and attachment of seismic restraints and expansion compensators. Show piping configuration including expansion compensators and piping lengths. Show anchorage details and indicate strength, quantity, diameter, and depth of penetration of anchors. Indicate direction and value of forces transmitted to piping and structure during seismic event and thermal expansion.
- C. Coordination Drawings: Plans and sections drawn to scale and coordinating seismic bracing and restraints for all components with other systems. Coordinate seismic restraints with vibration isolation and expansion compensation systems. All piping vibration isolation hangers, seismic restraints, and building expansion/seismic joint accommodation are to be laid out by the seismic engineer on each coordination drawing. The vibration/seismic professional engineer of record shall stamp every coordination drawing. If a particular coordination drawing does not require any isolation or restraints, the vibration/seismic engineer shall duly note that condition and stamp the drawing. Layouts of the restraints and isolation hangers by field personnel is not acceptable.
- D. Welding certificates.
- E. Qualification Data: For professional engineer and testing agency.

- F. **Manufacturer Seismic Qualification Certification:** Submit certification that all specified equipment will withstand seismic forces identified in "Performance Requirements" article above. Include the following:
1. **Basis for Certification:** Indicate whether withstand certification is based on actual test of assembled components or on calculations.
    - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  2. **Dimensioned Outline Drawings of Equipment Unit:** Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. **Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.**
- G. **Qualification Data:** For firms and persons specified in "Quality Assurance" article.
1. **Manufacturer:** Indicate whether withstand certification is based on actual test of assembled components or on calculations.
- H. **Insurance Certificates:** Submit for the following and in accordance with "Quality Assurance" article.
1. **Professional Engineer:** Professional liability.
  2. **Manufacturer:** Product liability.
- I. **Material Test Reports:** From a qualified testing agency indicating and interpreting test results of seismic control devices for compliance with requirements indicated.
- J. **Field quality-control test reports.**

#### 1.7 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. **Welding:** Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another independent agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- D. **Professional Engineer Qualifications:** A professional vibration/seismic engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in



providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of vibration isolation bases and seismic restraints that are similar to those indicated for this project in material, design, and extent. Engineer shall carry minimum \$1,000,000 professional liability insurance.

- E. Manufacturers of all vibration isolation and seismic restraint devices shall carry a minimum of \$5,000,000 product liability insurance for their products.

## 1.8 COORDINATION

- A. Coordinate size and location of concrete bases with seismic anchoring and vibration isolation requirements. Cast anchor-bolt inserts into base. Concrete, reinforcement, and formwork requirements are specified in Division 3.
- B. Coordinate design of seismic restraints and vibration isolation design with expansion compensation systems.
- C. Coordinate and design all attachments with building structural system.
- D. Coordinate and design all duct and pipe accommodations for building expansion/seismic joint crossovers.

## PART 2 - PRODUCTS

### 2.1 VIBRATION ISOLATORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - 1. Kinetics Noise Control.
  - 2. Mason Industries.
  - 3. Vibration Eliminator Co., Inc.
  - 4. Vibration Mountings & Controls, Inc.
- B. Elastomeric Pads: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and stainless steel baseplates, and factory cut to sizes that match requirements of supported equipment.
  - 1. Resilient Material: Oil- and water-resistant neoprene. Standard neoprene for indoor applications or where pad is not exposed to the elements. Bridge-bearing neoprene, complying with AASHTO M 251 for exterior applications or where pad is exposed to the elements.
- C. Spring Hangers with Vertical-Limit Stop: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression and with a vertical-limit stop.
  - 1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
8. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

## 2.2 SEISMIC-RESTRAINT DEVICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
1. Cooper B-Line, Inc.; a division of Cooper Industries.
  2. Hilti, Inc.
  3. Kinetics Noise Control.
  4. Mason Industries.
  5. Unistrut; Tyco International, Ltd.
  6. Vibration Mountings & Controls, Inc.
- B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an evaluation service member of ICC-ES, OSHPD or an independent agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Snubbers: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.
1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
  2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
  3. Maximum 1/4-inch air gap, and minimum 1/4-inch- thick resilient cushion.
- D. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- E. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- F. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or reinforcing steel angle clamped to hanger rod.

- G. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.
- H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.
- I. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- J. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- K. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

## 2.3 FACTORY FINISHES

- A. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
  - 1. Powder coating on springs and housings.
  - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
  - 3. Baked enamel or powder coat for metal components on isolators for interior use.
  - 4. Color-code or otherwise mark vibration isolation and seismic- and wind-control devices to indicate capacity range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation, seismic- and wind-control devices, and building expansion/seismic joint accommodation for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an evaluation service member of ICC-ES, OSHPD or an agency acceptable to authorities having jurisdiction.

- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

### 3.3 VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment Restraints:
  - 1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
  - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
  - 3. Install seismic-restraint devices using methods approved by an evaluation service member of ICC-ES, OSHPD or an independent agency acceptable to authorities having jurisdiction providing required submittals for component.
  - 4. Provide thrust restraints when the force of total air thrust exceeds ten percent of the isolated weight. Install thrust limits at centerline of thrust, symmetrical on either side of equipment.
- B. Piping Restraints:
  - 1. Comply with requirements in MSS SP-127.
  - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
  - 3. Brace a change of direction longer than 12 feet.
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install seismic-restraint devices using methods approved by an evaluation service member of ICC-ES, OSHPD or an agency acceptable to authorities having jurisdiction providing required submittals for component. In no case will the LOOPING of cable around piping systems be permitted on the project. Seismic restraints cables and angles shall be mechanically attached to the piping hangers with end fastening devices.
- E. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- F. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- G. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- H. Drilled-in Anchors:
  - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling.

Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

- I. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.

### 3.4 FIELD QUALITY CONTROL

- A. Upon completion of the project, the seismic design professional engineer of record shall visit the project site and supply a stamped letter of compliance. Any systems found to be installed insufficiently, provide additional measures necessary at contractor's expense to put the entire installation in compliance.
- B. The owner will engage a special inspector to perform field inspections and verification of proper installation of seismic anchorage and bracing of mechanical equipment, and manufacturer's component certifications of compliance. The contractor is to provide the special inspector safe access to the site throughout the duration of the mechanical work, and to provide timely notification to the special inspector at appropriate points in construction when seismic anchorage and bracing is to be installed.
- C. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- D. Tests and Inspections:
  1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
  2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
  3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
  4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
  5. Test to 90 percent of rated proof load of device.
  6. Measure isolator restraint clearance.
  7. Measure isolator deflection.
  8. Verify snubber minimum clearances.
  9. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

- E. Remove and replace malfunctioning units and retest as specified above.
- F. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

3.6 HVAC VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE SCHEDULE

- A. General: Schedule below indicates type of vibration isolator to be used with types of equipment. All rotating equipment shall have vibration isolation whether listed in schedule or not. Where equipment is not listed, provide isolation type of similar equipment or manufacturer recommended. Schedule below only indicates seismic restraint integral with vibration isolators where applicable. Seismically restrain all equipment using materials and products specified in this section. All equipment with vibration isolation shall be resiliently restrained.
- B. Components Mounted on Roof Outdoors:
  - 1. Piping:
    - a. Base: Steel dunnage field fabricated pipe support.
    - b. Isolator Type: None, anchor to structure.
  - 2. Cooling Towers:
    - a. Base: Steel dunnage.
    - b. Isolator Type: Elastomeric pad with 2-inch deflection.
- C. Components hung from overhead structure.
  - 1. Piping, first three supports from connection to pump or rotating equipment.
    - a. Isolator Type: Spring hangers with vertical limit stop, 1.0 inch deflection.
  - 2. All Other Piping:
    - a. Isolator Type: None.

END OF SECTION 230548  
08/19/2016

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Products specified are for applications referenced in other HVAC specifications.

1.2 SUMMARY

- A. Section Includes:
  - 1. Equipment labels.
  - 2. Pipe labels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label. Furnish extra copies, in addition to mounted copies, for inclusion in maintenance manuals. Provide one copy on electronic media, type specified by Owner.

1.4 QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME A13.1, "Scheme for the Identification of Piping Systems," for letter size, length of color field, colors, and viewing angles of identification devices for piping. Comply with recommendations in ASME A13.1 for labeling of equipment and ducts.

1.5 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Coordinate names, abbreviations, and other designations used in mechanical identification with Owner's desired identification scheme, regardless of numbering indicated on the drawing and specifications. Coordinate Owner's desired identification scheme with ASME and OSHA standards.
- D. Coordinate with Owner, locations of all identifying devices in public view areas.

## PART 2 - PRODUCTS

### 2.1 EQUIPMENT LABELS

#### A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Blue.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

#### B. Equipment Label Content: Include equipment's Drawing designation and Owner specified unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

#### C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

### 2.2 PIPE LABELS

#### A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction. Color shall comply with ASME A13.1 unless otherwise indicated.

#### B. Pretensioned Pipe Markers: Precoiled, semirigid plastic formed to cover circumference of pipe and to attach to pipe without fasteners or adhesive.

1. For Pipes Equal To or Greater Than 6 Inches Outside Diameter with Insulation: Partial cover of circumference with a minimum length and width three times greater than the total lettering size or shaped pipe markers.
2. For Pipes Less Than 6 Inches Outside Diameter with Insulation: Full cover of circumference.

#### C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.



- 2. Lettering Size: Manufacturer's standard preprinted captions appropriate for piping systems indicated or 1-1/2 inches high, if requested by Owner.
- D. Use metal labels for bare pipes conveying fluids at temperatures of 125 deg F or higher.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

#### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment. Major equipment includes, but is not limited to, the following:
  - 1. Cooling tower.
- B. Locate equipment labels where accessible and visible.
- C. Metal Label Content: Provide the following equipment information on metal labels only:
  - 1. Equipment drawing designation and Owner specified unique equipment identification number.
  - 2. Drawing numbers where equipment is located or specified (floor plans and schedules).
  - 3. Specification section equipment is specified.
  - 4. Manufacturer, model name and number, serial number(s).
  - 5. Labels of equipment listings by testing agencies (e.g., UL listings).
- D. Plastic Label Content: Provide the following equipment information on plastic labels:
  - 1. Capacity, operating and power characteristics (e.g., entering and leaving conditions, speed, pressure drop).
  - 2. Operating instructions and warnings.
  - 3. Safety warnings.
  - 4. Access panels and doors.

#### 3.3 PIPE LABEL INSTALLATION

- A. Manufactured Pipe Labels: Provided on all piping except piping in return air plenums.
- B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.

3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.

C. Pipe Label Color Schedule: According to ASME 13.1, unless otherwise specified.

#### 3.4 ADJUSTING

- A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

#### 3.5 CLEANING

- A. Clean faces of mechanical identification devices and glass frames of valve schedules.

END OF SECTION 230553  
08/19/2016

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Balancing New Hydronic Piping Systems:
    - a. Constant-flow hydronic systems.

1.3 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Pre-demolition testing report of existing cooling tower flow, including central system pump operating conditions, pressures.
- C. Certified TAB reports.
- D. Sample report forms.
- E. Sample pressure profile diagrams.
- F. Proposed pressure profile locations.
- G. Instrument calibration reports, to include the following:
  - 1. Instrument type and make.
  - 2. Serial number.
  - 3. Application.

4. Dates of use.
5. Dates of calibration.

#### 1.5 QUALITY ASSURANCE

- A. TAB Contractor Qualifications: Engage a TAB entity certified by TABB, AABC or NEBB.
  1. TAB Field Supervisor: Employee of the TAB contractor and certified by TABB, AABC or NEBB.
  2. TAB Technician: Employee of the TAB contractor and who is certified by TABB, AABC or NEBB as a TAB technician.
- B. TAB Conference: Meet with Engineer, Owner, and Mechanical and ATC Contractors to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.
  1. Agenda Items:
    - a. The TAB plan.
    - b. Coordination and cooperation of trades and subcontractors.
    - c. Coordination of documentation and communication flow.
- C. Certify TAB field data reports and perform the following:
  1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
- D. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.
- E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."
- F. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."
- G. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

#### 1.6 PROJECT CONDITIONS

- A. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

#### 1.7 COORDINATION

- A. Perform pre-demolition testing prior to any demolition.

- B. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.
- C. Perform TAB after leakage and pressure tests on water distribution systems have been satisfactorily completed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine equipment performance data including existing pump curves. Field obtain pump models and obtain curves from manufacturer.
- F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- G. Examine test reports specified in individual system and equipment Sections.
- H. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- I. Examine strainers. Verify that screens are not clogged.
- J. Examine existing system pumps to ensure absence of entrained air in the suction piping.
- K. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

- A. Complete system-readiness checks and prepare reports. Verify the following:
  - 1. Permanent electrical-power wiring is complete.

2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment access doors are securely closed.
5. Cooling tower isolating valves are open and bypass valves are closed.

### 3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
  1. Comply with requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."
- B. Cut insulation for pipes for installation of test probes to the minimum extent necessary for TAB procedures.
  1. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 "HVAC Piping Insulation."
- C. Mark equipment and balancing devices, including valve position indicators, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Upon successful completion of condenser water new cooling tower and existing pumps balancing, measure, record and provide for final reports, pressure profiles for condenser water systems. Pressure profiles shall include, but not be limited to the following:
  1. Existing Pumps: Pressure measurements across suction diffuser heads, pump suction/discharge, triple duty valves, and other pressure loss appurtenances.
- E. Take and report testing and balancing measurements in inch-pound (IP) units.

### 3.4 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. Prepare schematic diagrams of systems' "as-built" piping layouts.
- C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
  1. Open all manual valves for maximum flow.
  2. Check liquid level in expansion tank.
  3. Check makeup water-station pressure gage for adequate pressure for highest vent.
  4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
  5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
  6. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.

7. Check air vents for a forceful liquid flow exiting from vents when manually operated.

### 3.5 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

- A. Measure water flow at existing pumps and new cooling tower using ultrasonic flow meter. Use the following procedures except for positive-displacement pumps:
  1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
    - a. If impeller sizes must be adjusted to achieve pump performance, obtain approval from Architect and comply with requirements in Section 232123 "Hydronic Pumps."
  2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.
    - a. Monitor motor performance during procedures and do not operate motors in overload conditions.
  3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
  4. Report flow rates that are not within plus or minus 10 percent of design.
- B. Measure flow at cooling tower and set main balancing device at existing pump to achieve flow that is 5 percent greater than indicated flow.
- C. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.
- D. Check settings and operation of each safety valve. Record settings.

### 3.6 PROCEDURES FOR COOLING TOWERS

- A. Shut off makeup water for the duration of the test, and verify that makeup and blowdown systems are fully operational after tests and before leaving the equipment. Perform the following tests and record the results:
  1. Measure condenser-water flow to the cooling tower.
  2. Measure entering- and leaving-water temperatures.
  3. Measure wet- and dry-bulb temperatures of entering air.
  4. Measure wet- and dry-bulb temperatures of leaving air.
  5. Measure condenser-water flow rate recirculating through the cooling tower.
  6. Measure cooling-tower spray pump discharge pressure.
  7. Adjust water level and feed rate of makeup water system.

3.7 TOLERANCES

- A. Set HVAC system's water flow rates within the following tolerances:
  - 1. Condenser-Water Flow Rate: Plus or minus 5 percent.

3.8 REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Status Reports: Prepare bi-weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.9 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
  - 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
  - 2. Include a list of instruments used for procedures, along with proof of calibration.
- B. Final Report Contents: In addition to certified field-report data, include the following:
  - 1. Existing pump curves.
  - 2. Manufacturers' test data.
  - 3. Field test reports prepared by system and equipment installers.
  - 4. Other information relative to equipment performance; do not include Shop Drawings and product data.
- C. General Report Data: In addition to form titles and entries, include the following data:
  - 1. Title page.
  - 2. Name and address of the TAB contractor.
  - 3. Project name.
  - 4. Project location.
  - 5. Architect's name and address.
  - 6. Engineer's name and address.
  - 7. Contractor's name and address.
  - 8. Report date.
  - 9. Signature of TAB supervisor who certifies the report.
  - 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.



11. Summary of contents including the following:
    - a. Indicated versus final performance.
    - b. Notable characteristics of systems.
    - c. Description of system operation sequence if it varies from the Contract Documents.
  12. Nomenclature sheets for each item of equipment.
  13. Data for terminal units, including manufacturer's name, type, size, and fittings.
  14. Notes to explain why certain final data in the body of reports vary from indicated values.
  15. Test conditions for pump performance forms including the following:
    - a. Other system operating conditions that affect performance.
- D. Cooling Tower Test Reports:
1. Coil Data:
    - a. System identification.
    - b. Location.
    - c. Make and model number.
  2. Test Data (Indicated and Actual Values):
    - a. Air flow rate in cfm.
    - b. Outdoor-air, wet- and dry-bulb temperatures in deg. F.
    - c. Return-air, wet- and dry-bulb temperatures in deg. F.
    - d. Entering-air, wet- and dry-bulb temperatures in deg. F.
    - e. Leaving-air, wet- and dry-bulb temperatures in deg. F.
    - f. Water flow rate in gpm.
    - g. Water pressure differential in feet of head or psig.
    - h. Entering-water temperature in deg. F.
    - i. Leaving-water temperature in deg. F.
    - j. Spray pump flow.
    - k. Spray pump pressure.
- E. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:
1. Unit Data:
    - a. Unit identification.
    - b. Location.
    - c. Service.
    - d. Make and size.
    - e. Model number and serial number.
    - f. Water flow rate in gpm.
    - g. Water pressure differential in feet of head or psig.
    - h. Pump rpm.
    - i. Impeller diameter in inches.
    - j. Motor make and frame size.

- k. Motor horsepower and rpm.
- l. Voltage at each connection.
- m. Amperage for each phase.
- n. Full-load amperage and service factor.

2. Test Data (Indicated and Actual Values):

- a. Static head in feet of head or psig.
- b. Pump shutoff pressure in feet of head or psig.
- c. Actual impeller size in inches.
- d. Full-open flow rate in gpm.
- e. Full-open pressure in feet of head or psig.
- f. Final discharge pressure in feet of head or psig.
- g. Final suction pressure in feet of head or psig.
- h. Final total pressure in feet of head or psig.
- i. Final water flow rate in gpm.
- j. Voltage at each connection.
- k. Amperage for each phase.

F. Instrument Calibration Reports:

1. Report Data:

- a. Instrument type and make.
- b. Serial number.
- c. Application.
- d. Dates of use.
- e. Dates of calibration.

END OF SECTION 230593  
08/19/2016

## 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 DEFINITIONS

- A. Conditioned Space: An area, room, ceiling space/plenum or space within the building structure being heated or cooled (by direct expansion or chilled water) or both, by equipment or appliance and is not subject to outdoor ambient conditions.
- B. Unconditioned Space: An area, room or space within the building structure not being conditioned and subject to outdoor ambient conditions. Select examples: above ceiling spaces in ducted return systems, mechanical and electrical rooms, crawl spaces, tunnels, plenums or rooms connecting to the outside.
- C. Concealed Pipes: Pipes not visible within the room they are located, after the project is completed.
- D. Exposed Pipes: Pipes visible within the room they are located, after the project is completed.
- E. Ceiling Space/Plenum: An enclosed portion of the building structure, other than an occupiable space being conditioned, that is designed to allow air movement, and thereby serve as part of an air distribution system.

### 1.3 SUMMARY

- A. Section includes insulating the following HVAC piping systems:
  - 1. Cooling tower drain piping, indoors.
  - 2. Condenser-water, cold water makeup, and drain piping, heat traced, outdoors.

### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
  - 2. Detail attachment and covering of heat tracing inside insulation.
  - 3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
  - 4. Detail removable insulation at piping specialties.
  - 5. Detail application of field-applied jackets.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.8 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.9 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## PART 2 - PRODUCTS

### 2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Mineral-Fiber, Preformed Pipe Insulation:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Johns Manville; Micro-Lok.
    - b. Knauf Insulation; 1000-Degree Pipe Insulation.
    - c. Owens Corning; Fiberglas Pipe Insulation or SSL II.
  - 2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, minimum of 3.5 pounds per cubic foot density with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Aeroflex USA, Inc.; Aerocel.
    - b. Armacell LLC; AP Armaflex.
    - c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.

### 2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.

- b. Eagle Bridges - Marathon Industries; 225.
  - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
  - d. Mon-Eco Industries, Inc.; 22-25.
- 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. ASJ Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
- 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
    - b. Eagle Bridges - Marathon Industries; 225.
    - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
    - d. Mon-Eco Industries, Inc.; 22-25.
  - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.
- 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Aeroflex USA, Inc.; Aero seal.
    - b. Armacell LLC; Armaflex 520 Adhesive.
    - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-75.
    - d. K-Flex USA; R-373 Contact Adhesive.
  - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- 2.3 MASTICS
- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-80/30-90.
  - b. Vimasco Corporation; 749.
2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
5. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-10.
  - b. Eagle Bridges - Marathon Industries; 550.
  - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 46-50.
  - d. Mon-Eco Industries, Inc.; 55-50.
  - e. Vimasco Corporation; WC-1/WC-5.
2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: 60 percent by volume and 66 percent by weight.
5. Color: White.

## 2.4 SEALANTS

A. ASJ Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.5 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
  1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
  2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

## 2.6 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. Metal Jacket:
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Metal Jacketing Systems.
    - b. ITW Insulation Systems; Aluminum and Stainless Steel Jacketing.
    - c. RPR Products, Inc.; Insul-Mate.
  2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
    - a. Factory cut and rolled to required size.
    - b. Finish and thickness are indicated in field-applied jacket schedules.
    - c. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
    - d. Factory-Fabricated Fitting Covers:
      - 1) Same material, finish, and thickness as jacket.
      - 2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
      - 3) Tee covers.
      - 4) Flange and union covers.
      - 5) End caps.
      - 6) Beveled collars.
      - 7) Valve covers.
      - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

## 2.7 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.



1. Products: Subject to compliance with requirements, provide one of the following:
  - a. ABI, Ideal Tape Division; 428 AWF ASJ.
  - b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
  - c. Compac Corporation; 104 and 105.
  - d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

## 2.8 SECUREMENTS

### A. Bands:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. ITW Insulation Systems; Gerrard Strapping and Seals.
  - b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.
2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 3/4 inch wide with wing seal or closed seal.
3. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

### B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
  1. Verify that systems to be insulated have been tested and are free of defects.
  2. Verify that surfaces to be insulated are clean and dry.
  3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

### 3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
  - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
  - 1. Draw jacket tight and smooth.
  - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.

- a. For below-ambient services, apply vapor-barrier mastic over staples.
- 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
- 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above-ambient services, do not install insulation to the following:
  - 1. Vibration-control devices.
  - 2. Testing agency labels and stamps.
  - 3. Nameplates and data plates.
  - 4. Manholes.
  - 5. Handholes.
  - 6. Cleanouts.

### 3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
  - 1. Seal penetrations with flashing sealant.
  - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
  - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
  - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
  - 1. Comply with requirements for firestopping and fire-resistive joint sealers.
- D. Insulation Installation at Floor Penetrations:
  - 1. Pipe: Install insulation continuously through floor penetrations.

2. Seal penetrations through fire-rated assemblies.

### 3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
  1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
  2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
  3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
  4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
  5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
  6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
  7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
  8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
  9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
  2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
  3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
  4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
  5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

### 3.6 INSTALLATION OF MINERAL-FIBER INSULATION

#### A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

#### B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

#### C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.

2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 FIELD-APPLIED JACKET INSTALLATION

- A. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.9 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating prior to installation of field-applied jacket.
- B. Do not field paint aluminum jackets.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

3.11 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
  - 1. Drainage piping located in crawl spaces.
  - 2. Underground piping.
  - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.
- C. Service Drains and Vents: Insulation and jacketing to be the same as for the piping system served.

3.12 INDOOR, CONDITIONED SPACE PIPING INSULATION SCHEDULE

- A. Mineral-Fiber, Preformed Pipe, Type I:

Service	Temp. Deg. F	1.5" to 3"
Cooling Tower Drain	<60	1

3.13 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Flexible Elastomeric, Type I:

Service	Temp. Deg. F	1" and Less	1" to 1.25"	1.5" to 3"	4" to 6"	8" and Larger
Condenser Water, Cold water makeup and Drain piping with Heat Trace	105-200	2.5	2.5	2.5	3.5	3.5

3.14 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. Piping, Concealed:
  - 1. None.
- C. Piping, Exposed:
  - 1. None.

3.15 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Installed jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. Piping, Exposed:
  - 1. Aluminum, Stucco Embossed: 0.032 inch thick.

END OF SECTION 230719  
08/19/2016



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. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls.
- B. This Section includes the following items for wiring systems used as signal pathways for high-speed data transmission:
  - 1. Mounting elements.
  - 2. Unshielded twisted-pair cabling.
- C. Work in this Section includes:
  - 1. A complete system including power and control wiring of all control system components and devices.
  - 2. Wiring circuits which are activated/de-activated by a control system component, such as but not limited to, EP/PE devices, high and low limit protective devices, solenoid air valves, relays, end switches, etc.
  - 3. Control panel wiring to control panels (unless noted otherwise) and to terminal strips, and field wiring from terminal strips to field-mounted devices.
  - 4. Wiring to the "auto" side of hand-off-auto switches on units being controlled by the controls contractor.
  - 5. Wiring of all electro-mechanical devices required to be located on or in temperature control panels.
  - 6. Power and control wiring to all control system equipment including, but not limited to, control panels, control transformers, relays, transformers, PE switches, and all other control devices. Provide power wiring from 120-V/1-phase/20 amp J-box provide in third floor electrical room per Division 26 as noted on drawings. Circuit breakers and j-box provided under Division 26 Section "Panelboards." Coordinate requirements with the Division 26 Contractor. Connect all controls including control panels, controllers, actuators, etc., to normal branch of power.
  - 7. Control equipment and devices that are provided with a voltage rating readily available at the location of installation. Coordinate with Contract Documents and Division 26 Contractor.
  - 8. Power and control wiring between cooling tower remote power/control panel and cooling tower mounted control devices (i.e., cooling tower vibration switches, dampers, level control, makeup water valve, sump temperature sensors, DDC control points, etc.). See detail on drawings for additional information.
  - 9. Provision and wiring of all remote manual control devices, including but not limited to, on/off switches, on/off switches with pilot lights, etc.

10. All line voltage wiring and conduit. Comply with the requirements of Division 26 Section "Wires and Cables." A licensed electrician shall perform all work in strict accordance with the NEC and other local codes.
  11. All control wiring and cable. A licensed electrician shall perform all work in strict accordance with the NEC and other local codes.
  12. Integration with balancing work to provide support and calibration.
  13. Ethernet devices, hardware and coordination as required to access LAN and Internet.
- D. Work By Others: The following work shall be performed by the associated division contractor under the supervision and coordination of this subcontractor.
1. Division 23 Sections "Hydronic Piping" contractor shall be responsible for:
    - a. Installation of all separable wells furnished under this contract.
    - b. Furnish and install all necessary valved pressure taps, water and drain wells and overflow connections to piping.
    - c. Furnish and install all necessary piping connections required for flow indicating devices.
  2. Division 26 contract shall be responsible for:
    - a. Furnishing, installing and terminating all feeder and/or branch circuit wiring to major equipment including:
      - 1) Wiring to and between all disconnects, starters, drives and equipment motors.
      - 2) Power wiring to cooling tower remote power/control panel and between panel and cooling tower fans, pumps, and basin heaters. See details on drawings for additional information.
    - b. Furnishing and installing of circuit breakers (20 A-1 phase) in existing third floor power panels to J-box for use by the ATCS Contractor to power the new cooling tower DDC controller.

### 1.3 DEFINITIONS

- A. Backbone: A facility (e.g., pathway, cable, or conductors) between automation system cabinets or between buildings.
- B. BICSI: Building Industry Consulting Service International.
- C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- D. DDC: Direct digital control.
- E. EMI: Electromagnetic interference.
- F. Horizontal Cabling: Cabling between, and including, the building automation system outlet or the first mechanical terminations on the horizontal connection point and the horizontal cross-connect.

- G. IDC: Insulation displacement connector.
  - H. I/O: Input/output.
  - I. LAN: Local area network.
  - J. MS/TP: Master slave/token passing.
  - K. PID: Proportional plus integral plus derivative.
  - L. RCDD: Registered Communications Distribution Designer.
  - M. RMC: Rigid metallic conduit.
  - N. RTD: Resistance temperature detector.
  - O. UTP: Unshielded twisted pair.
- 1.4 SYSTEM PERFORMANCE
- A. Comply with the following performance requirements:
    - 1. Graphic Display: Display graphic with minimum 20 dynamic points with current data within 10 seconds.
    - 2. Graphic Refresh: Update graphic with minimum 20 dynamic points with current data within 8 seconds.
    - 3. Object Command: Reaction time of less than two seconds between operator command of a binary object and device reaction.
    - 4. Object Scan: Transmit change of state and change of analog values to control units or workstation within six seconds.
    - 5. Alarm Response Time: Annunciate alarm at workstation within 45 seconds. Multiple workstations must receive alarms within five seconds of each other.
    - 6. Program Execution Frequency: Run capability of applications as often as five seconds, but selected consistent with mechanical process under control.
    - 7. Performance: Programmable controllers shall execute DDC PID control loops, and scan and update process values and outputs at least once per second.
    - 8. Reporting Accuracy: The system shall report all values with an end to end minimum accuracy as follows:
      - a. Water Temperature: Plus or minus 1 deg F.
      - b. Water Flow: Plus or minus 5 percent of full scale.
      - c. Water Pressure: Plus or minus 2 percent of full scale.
      - d. Space Temperature: Plus or minus 1 deg F.
      - e. Ducted Air Temperature: Plus or minus 1 deg F.
      - f. Outside Air Temperature: Plus or minus 2 deg F.
      - g. Dew Point Temperature: Plus or minus 3 deg F.
      - h. Temperature Differential: Plus or minus 0.25 deg F.
      - i. Relative Humidity: Plus or minus 5 percent.
      - j. Airflow (Pressurized Spaces): Plus or minus 3 percent of full scale.
      - k. Airflow (Measuring Stations): Plus or minus 5 percent of full scale.
      - l. Airflow (Terminal): Plus or minus 10 percent of full scale.

- m. Air Pressure (Space): Plus or minus 0.01-inch wg.
  - n. Air Pressure (Ducts): Plus or minus 0.1-inch wg.
  - o. Carbon Monoxide: Plus or minus 5 percent of reading.
  - p. Carbon Dioxide: Plus or minus 50 ppm.
  - q. Electrical: Plus or minus 5 percent of reading.
9. Stability and Accuracy of Control: Control loops shall maintain measured variable at setpoint within the following minimum tolerances:
- a. Liquid Pressure (Greater Than 1 psig): Plus or minus 1.5 psig.
  - b. Liquid Pressure (Less Than 50 Inch wg): Plus or minus 1.0 inch wg.
  - c. Air Pressure (0-6 Inch wg Range): Plus or minus 0.2 .
  - d. Air Pressure (0.01-0.1 Inch wg Range): Plus or minus 0.01 inch wg.
  - e. Air Flow: Plus or minus 10% of full range.
  - f. Space Temperature: Plus or minus 2 deg F.
  - g. Duct Temperature: Plus or minus 3 deg F.
  - h. Relative Humidity: Plus or minus 5 percent.
- B. Existing System Interface: Interface new system and controllers with existing system. Provide all necessary hardware, software, gateways, mapping, programming, etc., to seamlessly interface new system to existing Alerton IBEX control system, including programming and graphics on existing Alerton IBEX system. All points, commands, and graphics shall be functional on existing headend system.

#### 1.5 COMMON REQUIREMENTS FOR SEQUENCES OF OPERATION

- A. The following items are common requirements that apply unless noted otherwise:
- 1. All setpoints shall be program adjustable at the operator workstation.
  - 2. All high and low limits shall be alarmed.
  - 3. All hydronic proof of flow shall be via current sensors.
  - 4. All unit protective shutdown shall be done by hardwired relay interlock and shall not rely on control system programming.
  - 5. All loss of power shutdowns shall have auto-restart once power restored or fire alarm condition cleared.

#### 1.6 SUBMITTALS

- A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.
- 1. DDC System Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for operator workstation equipment, interface equipment, control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
  - 2. Control System Software: Include technical data for operating system software, operator interface, color graphics, and other third-party applications.
  - 3. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.

4. New system to existing system interface devices.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
  2. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.
  3. Wiring Diagrams: Power, signal, and control wiring.
  4. Details of control panel faces, including controls, instruments, and labeling.
  5. Written description of sequence of operation.
  6. Schedule of valves including flow characteristics.
  7. DDC System Hardware:
    - a. Wiring diagrams for control units with termination numbers.
    - b. Schematic diagrams for control, communication, and power wiring, showing trunk data conductors and wiring between operator workstation and control unit locations.
  8. Control System Software: List of color graphics indicating monitored systems, data (connected and calculated) point addresses, output schedule, operator notations, and a graphics tree showing how graphics are organized and linked.
  9. Controlled Systems:
    - a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
    - b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
    - c. Written description of sequence of operation including schematic diagram.
    - d. Points list.
  10. New system to existing system interface.
- C. Software and Firmware Operational Documentation: Include the following:
1. Software operating and upgrade manuals.
  2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
  3. Device address list.
  4. Printout of software application and graphic screens.
  5. Software license required by and installed for DDC workstations and control systems.
- D. Software Upgrade Kit: For Owner to use in modifying software to suit future systems revisions or monitoring and control revisions.
- E. Qualification Data: For Installer and manufacturer.
- F. Field quality-control test reports.

- G. Operation and Maintenance Data: For HVAC instrumentation and control system to include in emergency, operation, and maintenance manuals. In addition, include the following:
  - 1. Maintenance instructions and lists of spare parts for each type of control device and compressed-air station.
  - 2. Interconnection wiring diagrams with identified and numbered system components and devices.
  - 3. Keyboard illustrations and step-by-step procedures indexed for each operator function.
  - 4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
  - 5. Calibration records and list of set points.
  - 6. An electronic copy of all graphics, programming and settings in final as-built form on a CD-ROM.
- H. Project Record Drawings: These shall be as-built versions of the submittal shop drawings. One set of magnetic media including CAD, .DWG, or .DXF drawing files also shall be provided.
- I. Testing and Commissioning Reports and Checklists: Completed versions of all reports and checklists, along with all trend logs used.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.
- B. Installer Qualifications: Cabling installer must have on staff personnel certified by BICSI.
  - 1. Installation Supervision: Installation shall be under the direct supervision of a Registered Technician, who shall be present at all times when Work of this Section is performed at the project site.
- C. Electrical Installer: Line voltage wiring for the automatic control system shall be done by a Licensed Electrician.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to equipment manufacturer.
- B. System Software: Update to latest version of software at Project completion.

#### 1.9 COORDINATION

- A. Coordinate and confirm location of thermostats, humidistats, and other exposed control sensors with Owner/Engineer and plans and room details before installation.

- B. Coordinate supply of conditioned electrical branch circuits for control units and operator workstation, including emergency power to all control components necessary to assure proper operation of HVAC equipment on the emergency power distribution system.
- C. Coordinate equipment with "Panelboards" to achieve compatibility with starter coils and annunciation devices.
- D. Coordinate equipment with Division 26 Sections "Enclosed Controllers" and "Variable-Frequency Motor Controllers" to achieve compatibility with controllers and annunciation devices.
- E. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.
- F. Coordinate support of balancing requirements and system component calibration requirements with Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

#### 1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Additional Points: Provide a minimum of 10% spare point hardware capacity in each controller and panel of each point type; analog and digital, input and output powered and dry.
  - 2. Replacement Materials: 5%, but no less than 2 of each type of wall mounted sensor (thermostats, temperature sensors, humidity sensors, etc.).

#### 1.11 LICENSING

- A. Software: Owner has full license of use of all software programming, including the right to change and edit programming to suit needs.
- B. Protocols: Owner has full license to all system and networking protocols.
- C. Points: Owner has full license to all system points to change, modify or otherwise alter to suit needs.

#### 1.12 TRAINING

- A. Provide eight (8) hours total of training on site, with training to be performed at the end of each major phase covering work completed for that phase.
- B. The BAS Contractor shall provide instructors to give full instructions to designated personnel in the adjustment, operation, and maintenance of the system installed. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All training shall be held during normal work hours of 8:00 am to 4:30 pm weekdays.
- C. Training shall include, but not be limited to, the following:
  - 1. Explanation of drawings and operations and maintenance manuals.
  - 2. Walk-through of the job to locate control components.
  - 3. DDC controller and TEC operation.

4. Explanation of adjustment, calibration, and replacement procedures.
- D. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's representative. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. The instruction shall be scheduled in coordination with the Construction Manager after submission and approval of formal training plans.

## PART 2 - PRODUCTS

### 2.1 COMMUNICATION AND ARCHITECTURE

- A. All control products provided for this project shall comprise of an extension of the existing internetwork.
- B. Each device shall operate on the existing protocol specified for that device as defined in this Section.
- C. The Contractor shall provide all communication media, connectors, repeaters, hubs, and routers necessary for the internetwork.
- D. All controllers shall have a communication port for connections with the operator interfaces using existing protocol.
- E. Building Controllers: Provide an adequate number of building controllers to achieve the performance specified in Part 1 article on "System Performance." Each of these panels shall meet the following requirements:
  1. The Building Automation System (BAS) shall be composed of one or more independent, standalone, microprocessor-based building controllers to manage the global strategies of the system.
  2. The building controller shall have sufficient memory to support its operating system, database, trending, and programming requirements.
  3. Data shall be shared between the new controller and existing networked building controllers.
  4. The operating system of the building controller shall manage the input and output communication signals to allow distributed controllers to share real and virtual object information and allow for central monitoring and alarms.
  5. Each new building controller shall interface with the existing Alerton IBEX network.
  6. The new controllers shall provide a service communication port using IBEX protocol for connection to a portable operator's terminal.
  7. Provide all necessary hardware, software, gateways, mapping, programming, etc., to seamlessly interface new controller system to existing Alerton IBEX control system.
- F. Manufacturers:
  1. Alerton, IBEX series.
  2. Automated Logic Corporation; WebCTRL.
  3. Tridium, Inc., Vykon.



- G. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, power and control wiring, and accessories to control mechanical systems.
1. Connect all controls including control panels, controllers, actuators, etc., to normal branch of power.
  2. Interface with existing building control system, including existing heat pump loop control.

## 2.2 DDC EQUIPMENT

- A. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.
1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation or diagnostic terminal unit.
  2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
    - a. Global communications.
    - b. Discrete/digital, analog, and pulse I/O.
    - c. Monitoring, controlling, or addressing data points.
    - d. Software applications, scheduling, and alarm processing.
    - e. Testing and developing control algorithms without disrupting field hardware and controlled environment.
  3. Standard Application Programs:
    - a. Electric Control Programs: Demand limiting, duty cycling, automatic time scheduling, start/stop time optimization, night setback/setup, on-off control with differential sequencing, staggered start, antishort cycling, PID control, DDC with fine tuning, and trend logging.
    - b. HVAC Control Programs: Optimal run time, supply-air reset, and enthalpy switchover.
    - c. Chiller Control Programs: Control function of condenser-water reset, chilled-water reset, and equipment sequencing.
    - d. Programming Application Features: Include trend point; alarm processing and messaging; weekly, monthly, and annual scheduling; energy calculations; run-time totalization; and security access.
    - e. Remote communications.
    - f. Maintenance management.
    - g. Units of Measure: Inch-pound and SI (metric).
  4. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
- B. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.
  2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
    - a. Global communications.
    - b. Discrete/digital, analog, and pulse I/O.
    - c. Monitoring, controlling, or addressing data points.
  3. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
- C. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.
1. Binary Inputs: Allow monitoring of on-off signals without external power.
  2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
  3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
  4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation.
  5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA).
  6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
  7. Universal I/Os: Provide software selectable binary or analog outputs.
- D. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:
1. Output ripple of 5.0 mV maximum peak to peak.
  2. Combined 1 percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
  3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.
- E. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:
1. Minimum dielectric strength of 1000 V.
  2. Maximum response time of 10 nanoseconds.
  3. Minimum transverse-mode noise attenuation of 65 dB.
  4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.
- 2.3 UNITARY CONTROLLERS
- A. Unitized, capable of stand-alone operation with sufficient memory to support its operating system, database, and programming requirements, and with sufficient I/O capacity for the application.

1. Configuration: Local keypad and display; diagnostic LEDs for power, communication, and processor; wiring termination to terminal strip or card connected with ribbon cable; memory with bios; and 72-hour battery backup.
2. Operating System: Manage I/O communication to allow distributed controllers to share real and virtual object information and allow central monitoring and alarms. Perform scheduling with real-time clock. Perform automatic system diagnostics; monitor system and report failures.
3. Enclosure: Dustproof rated for operation at 32 to 120 deg F.
4. Enclosure: Waterproof rated for operation at 40 to 150 deg F.

## 2.4 INPUT DEVICES

### A. General Requirements:

1. Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements.

### B. Temperature Sensors:

#### 1. Manufacturers:

- a. Primary controls manufacturer.
- b. Ashcroft, Inc.
- c. MAMAC Systems, Inc.
- d. Vaisala Group.
- e. Veris Industries.

#### 2. General Requirements:

- a. The temperature sensor shall be of the resistance type and shall be 2-wire 1000 ohm RTD.

#### 3. Thermo Wells:

- a. Thermo wells shall be pressure-rated and constructed in accordance with the system working pressure.
- b. Thermo wells and sensors shall be mounted in a threadolet or 1/2" NPT saddle and allow easy access to the sensor for repair or replacement.

### C. Differential Pressure Transmitters/Transducers:

#### 1. Manufacturers:

- a. Ashcroft, Inc.
- b. MAMAC Systems, Inc.
- c. Setra Systems, Inc.
- d. Veris Industries.

2. General Water Pressure Transmitter Requirements:
  - a. Pressure transmitters shall be constructed to withstand 100% pressure over-range without damage, and to hold calibrated accuracy when subject to a momentary 40% over-range input.
  - b. Pressure transmitters shall transmit a 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 mA output signal.
  - c. Differential pressure transmitters used for flow measurement shall be sized to the flow sensing device, and shall be supplied with tee fittings and shutoff valves in the high and low sensing pickup lines to allow the Balancing Contractor and Owner permanent, easy-to-use connection.
  - d. A minimum of a NEMA 1 housing shall be provided for the transmitter. Transmitters shall be located in accessible local control panels wherever possible.
3. Low Differential Water Pressure Applications (0" to 20" w.c.):
  - a. The differential pressure transmitter shall be of industrial quality and transmit a linear, 4 to 20 mA output in response to variation of flow meter differential pressure or water pressure sensing points.
  - b. The differential pressure transmitter shall have non-interactive zero and span adjustments that are adjustable from the outside cover and meet the following performance specifications:
    - 1) 0.01 to 20" w.c. input differential pressure range.
    - 2) 4-20 mA output.
    - 3) Maintain accuracy up to 20 to 1 ratio turndown.
    - 4) Reference Accuracy: +0.2% of full span.
4. Medium to High Differential Water Pressure Applications (Over 21" w.c.):
  - a. The differential pressure transmitter shall meet the low pressure transmitter specifications with the following exceptions:
    - 1) Differential pressure range 10" w.c. to 300 psi.
    - 2) Reference Accuracy: +1% of full span (includes non-linearity, hysteresis, and repeatability).
  - b. Standalone pressure transmitters shall be mounted in a bypass valve assembly panel. The panel shall be constructed to NEMA 1 standards. The transmitter shall be installed in the panel with high and low connections piped and valved. Air bleed units, bypass valves, and compression fittings shall be provided.

D. Status and Safety Switches:

1. General Requirements:
  - a. Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the BMS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts and shall be interlock wired to shut down respective equipment.

2. Current Sensing Switches:
  - a. Manufacturers:
    - 1) Setra Systems, Inc.
    - 2) Veris Industries.
  - b. The current sensing switch shall be self-powered with solid-state circuitry and a dry contact output. It shall consist of a current transformer, a solid state current sensing circuit, adjustable trip point, solid-state switch, SPDT relay, and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept over-current up to twice its trip point range.
  - c. Current sensing switches shall be used for run status for fans, pumps, and other miscellaneous motor loads.
  - d. Current sensing switches shall be calibrated to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.

## 2.5 MISCELLANEOUS DEVICES

### A. Local Control Panels:

1. All control panels shall be factory constructed, incorporating the BAS manufacturer's standard designs and layouts. All control panels shall be UL inspected and listed as an assembly and carry a UL 508 label listing compliance. Control panels shall be fully enclosed, with perforated sub-panel, hinged door and slotted flush latch.
2. In general, the control panels shall consist of the DDC controller(s) and I/O devices such as relays, transducers, and so forth that are not required to be located external to the control panel due to function. Where specified the display module shall be flush-mounted in the panel face unless otherwise noted.
3. All I/O connections on the DDC controller shall be provided via removable or fixed screw terminals.
4. Low and line voltage wiring shall be segregated. All provided terminal strips and wiring shall be UL listed, 300 volt service and provide adequate clearance for field wiring.
5. All wiring shall be neatly installed in plastic trays or tie-wrapped.
6. A convenience 120 Vac duplex receptacle shall be provided in each enclosure, fused on/off power switch, and required transformers.

### B. Power Supplies:

1. DC power supplies shall be sized for the connected device load. Total rated load shall not exceed 75% of the rated capacity of the power supply.
2. Input: 120 Vac +10%, 60 Hz.
3. Output: 24 Vdc.
4. Line Regulation: +0.05% for 10% line change.
5. Load Regulation: +0.05% for 50% load change.
6. Ripple and Noise: 1 mV rms, 5 mV peak to peak.
7. An appropriately sized fuse and fuse block shall be provided and located next to the power supply.
8. A power disconnect switch shall be provided next to the power supply.

2.6 UNSHIELDED TWISTED-PAIR CABLING

A. Cable Manufacturers:

1. Avaya Inc.
2. Belden Inc.; Electronics Division.
3. CommScope Properties, LLC.
4. General Cable Technologies Corporation.
5. Helix/HiTemp Cables, Inc.
6. KRONE Incorporated.
7. Mohawk/CDT; a division of Cable Design Technologies.
8. Nordex/CDT; a Subsidiary of Cable Design Technologies.
9. Remeo Products Corp.
10. Superior Essex; Superior Telecommunications Inc.
11. West Penn Wire/CDT; a division of Cable Design Technologies.

B. Terminal and Connector Component Manufacturers:

1. AMP; a Tyco International Ltd. Company.
2. Amphenol Corporation.
3. Avaya Inc.
4. Connect-Tech Products.
5. Cooper Wiring Devices; a division of Cooper Industries, Inc.
6. Homaco.
7. Hubbell Premise Wiring.
8. KRONE Incorporated.
9. Leviton Voice & Data Division.
10. Lucent Technologies; Global Service Provider.
11. Mohawk/CDT; a division of Cable Design Technologies.
12. Molex Premise Networks; a division of Molex, Incorporated.
13. Nordex/CDT; a Subsidiary of Cable Design Technologies.
14. Panduit Corp.
15. Thomas & Betts Corporation.

C. 100-Ohm UTP: Comply with UL 444.

D. Backbone Copper Cable:

1. No. 24 AWG.
2. Comply with ICEA S-80-576 and TIA/EIA-568 B.2, Categories 5e and 6.
3. NFPA 70, Type CMR complying with UL 1666.
4. Cable Jacket Color: Color coded in accordance with Owner's standards. Coordinate with Owner in field.

E. Horizontal Copper Cable:

1. No. 24 AWG, 100 ohm, four pair.
2. Comply with TIA/EIA-568-B.2, Categories 5e and 6.
3. NFPA 70, Types CMG and CMP.
4. Cable Jacket Color: Color coded in accordance with Owner's standards. Coordinate with Owner in field.

- F. Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, using modules designed for punch-down caps or tools.
  - 1. IDC Terminal Block Modules: Integral with connector bodies, including plugs and jackets where indicated.
  - 2. IDC Connecting Hardware: Consistent throughout Project.
- G. Patch Panel: Comply with TIA/EIA-568-B.2, meeting or exceeding cable performance. Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
  - 1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to satisfy specified expansion criteria.
- H. Jack and Jack Assemblies: Modular, color-coded, RJ-45 receptacle units with integral IDC-type terminals. Use keyed jacks for data service.
- I. Patch Cords: Factory-made, four-pair cables in 48-inch lengths; terminated with RJ-45 plug at each end. Use keyed plugs for data service.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION STANDARDS

- A. Comply with BICSI TCI, TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3, and TIA/EIA-569-A.

#### 3.2 TAB SUPPORT

- A. Pre-TAB Meeting: Approximately 2 weeks prior to the initiation of Division 23 "Testing, Adjusting and Balancing for HVAC" services on site, schedule a meeting giving notice to the Owner and Engineer.
  - 1. Publish an agenda with a minimum of the following discussion items:
    - a. "Instrumentation and Controls for HVAC" sequence of upcoming construction.
    - b. "Testing, Adjusting and Balancing for HVAC" sequence of upcoming construction.
    - c. TAB for support from "Instrumentation and Controls for HVAC."
    - d. "Instrumentation and Controls for HVAC" requirements for support from TAB.
    - e. Timing, support and documentation procedures.
    - f. Operation, diversities and setpoints of systems and equipment.
- B. Division 23 "Testing, Adjusting and Balancing for HVAC" shall fully support Division 23 "Instrumentation and Controls for HVAC" in the testing and calibration of all devices with fluid flow, motor transformers, static pressures and the like and shall coordinate work so as to not interfere with instrumentation and controls installation and setup activities.
- C. Division 23 "Instrumentation and Controls for HVAC" shall fully support Division 23 "Testing, Adjusting and Balancing for HVAC" in the operation, start and stop of all systems as well as the

setting of values required for proper balancing and shall coordinate work so as to not interfere with TAB activities.

### 3.3 EXAMINATION

- A. Verify that power supply is available for control units and operator workstation.
- B. Verify that duct-, pipe-, and equipment-mounted devices are installed before proceeding with installation.
- C. Examine pathway elements intended for cables.
  - 1. Verify proposed routes of pathways. Check raceways, cable trays, and other elements for compliance with space allocations, clearances, installation tolerances, hazards to cable installation, and other conditions affecting installation. Verify that cabling can be installed complying with EMI clearance requirements.
  - 2. Prepare wall penetrations and verify that penetrations of rated fire walls are made using products labeled for type of wall penetrated.
  - 3. Identify plan to support cables and raceways in suspended ceilings. Verify weight of individual types and sizes of cables. Verify that load capacity of cable support structures is adequate for each pathway.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.4 INSTALLATION

- A. Install software in control units and operator workstation(s). Implement all features of programs to specified requirements and as appropriate to sequence of operation.
- B. Connect and configure equipment and software to achieve sequence of operation specified.
- C. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 60 inches above the floor.
- D. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.
- E. Install labels and nameplates to identify control components according to Division 23 Section "Identification for HVAC Piping and Equipment."
- F. Install hydronic instrument wells, valves, and other accessories according to Division 23 Section "Hydronic Piping."

### 3.5 APPLICATION OF MEDIA

- A. Backbone Cable for Data Service: Use UTP Category 6 for runs between cabinets.
- B. Horizontal Cable for Data Service: Use UTP Category 5e cable for runs between cabinets and peripheral equipment.



3.6 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Comply with NECA 1.
- B. Wiring Method: Install wiring in raceway within the following areas: mechanical rooms, electrical rooms, exposed areas, within walls and above inaccessible ceilings. Conceal raceway except in mechanical rooms and areas where other raceway and piping are exposed.
- C. Wiring Method: Install wiring in raceway except in consoles, cabinets, and in accessible ceiling spaces where unenclosed wiring method may be used for systems that are not part of life safety systems, including but not limited to, smoke exhaust systems, stair pressurization systems, smoke control systems, or hazardous exhaust systems, or systems on emergency/standby power, or main communications systems cable. Use UL listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in mechanical rooms and areas where other raceway and piping are exposed.
- D. Cable Installation:
  - 1. Install exposed cables parallel and perpendicular to surfaces or exposed structural members and follow surface contours where possible.
  - 2. Make splices, taps, and terminations only at indicated outlets, terminals, and cross-connect and patch panels.
  - 3. Pulling Cable: Do not exceed manufacturer's written recommended pulling tensions. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
  - 4. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
  - 5. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
  - 6. Install UTP cables using techniques, practices, and methods that are consistent with Category 5e or 6 rating of components and that ensure Category 5e or 6 performance of completed and linked signal paths, end to end.
    - a. Do not untwist more than 1/2 inch of Categories 5e and 6 cables at connector terminations.
- E. Separation from EMI Sources: Comply with BICSI TDM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment. Comply with the following minimum separation distances from possible sources of EMI:
  - 1. Separation between unshielded power lines or electrical equipment in proximity to open cables or cables in nonmetallic raceways is as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: 5 inches.
    - b. Electrical Equipment Rating Between 2 and 5 kVA: 12 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: 24 inches.

2. Separation between unshielded power lines or electrical equipment in proximity to cables in grounded metallic raceways is as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: 2-1/2 inches.
    - b. Electrical Equipment Rating Between 2 and 5 kVA: 6 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: 12 inches.
  3. Separation between power lines and electrical equipment located in grounded metallic conduits or enclosures in proximity to cables in grounded metallic raceways is as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
    - b. Electrical Equipment Rating Between 2 and 5 kVA: 3 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: 6 inches.
  4. Electrical Motors and Transformers, 5 kVA or HP and Larger: 48 inches.
  5. Fluorescent Fixtures: 5 inches.
- F. Conduit:
1. Comply with TIA/EIA-569-A for maximum length of conduit and bends between pull points, and for pull-box sizing.
  2. Use manufactured conduit sweeps and long-radius ells whenever possible.
  3. In mechanical rooms, position conduit ends adjacent to a corner on backboard (in case of a single piece of plywood) or in the corner of room (where multiple sheets of plywood are installed around perimeter walls of room). Use cable trays to route cables if conduits cannot be located in these positions. Secure conduits to backboard when entering room from overhead. Extend conduits 1 to 3 inches in finished floor.
  4. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
  5. Install exposed cable in raceway.
  6. Install concealed cable in raceway.
  7. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.
  8. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
  9. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
  10. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.
- G. Install raceways, boxes, and cabinets according to Division 26 Section "Raceway and Boxes for Electrical Systems."
- H. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.
- I. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.
- J. Install color-coded cables in accordance with Owner's standards. Coordinate with Owner in field.

### 3.7 GROUNDING

- A. Comply with Division 26 Section "Grounding and Bonding for Electrical Systems" and with TIA/EIA 607.
- B. Grounding Points:
  - 1. Locate grounding terminals in each equipment room, wiring closet, rack, and cabinet.
  - 2. Telecommunications Grounding Busbars: Mount on wall of equipment room and closet, with standoff insulators.
- C. Bonding Conductors:
  - 1. Extend from telecommunications entrance facility to grounding busbars.
  - 2. Extend from grounding busbars to ground terminals in cabinets.
- D. Special Requirements:
  - 1. Bonding conductors shall be insulated copper, No. 6 AWG minimum.
  - 2. Install only in nonmetallic conduit, unless specifically required for protection of conductor. Metallic conduit, if used, shall be RMC. For RMC that exceeds 36 inches in length, conductors shall be bonded at each end of conduit.
  - 3. Bonding conductors shall be installed without splices unless approved by Architect because of special circumstances. Where splices are necessary, they shall be accessible and shall be located in telecommunications spaces. Splices shall be by irreversible compression connectors or by exothermic welding.

### 3.8 EXISTING BUILDING CONTROL AND MONITORING NETWORK

- A. Connect to existing building central control and monitoring systems. Provide all hardware, software, protocols and cabling required for a complete interface.
- B. All interface, alarms, graphics, system control, editing, and other functionalities of this system shall be fully operable at the campus head end system.
- C. Confirm restrictions and requirements with Owner for any campus IT backbone, campus standards, campus interfacing, etc.

### 3.9 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
  - 2. Test and adjust controls and safeties.
  - 3. Test calibration of electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.

4. Test each point through its full operating range to verify that safety and operating control set points are as required.
  5. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
  6. Test each system for compliance with sequence of operation.
  7. Test software and hardware interlocks.
- C. DDC Verification:
1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
  2. Check instruments for proper location and accessibility.
  3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
  4. Check instrument tubing for proper fittings, slope, material, and support.
  5. Check installation of air supply for each instrument.
  6. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
  7. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
  8. Check temperature instruments and material and length of sensing elements.
  9. Check control valves. Verify that they are in correct direction.
  10. Check DDC system as follows:
    - a. Verify that DDC controller power supply is from emergency power supply, if applicable.
    - b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
    - c. Verify that spare I/O capacity has been provided.
    - d. Verify that DDC controllers are protected from power supply surges.
- D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.
- E. In addition to requirements in this Article, comply with TIA/EIA-606-A and with applicable requirements in Division 26 Section "Identification for Electrical Systems."
1. Administration class for this Project shall be Class 2 or 3.
  2. Color-code cross-connect fields. Apply colors to service backboards, connections, covers, and labels.
- F. Using cable and asset management software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable, jacks, connectors, and terminals to which it connects with same designation. Use logical and systematic designations for facility's architectural arrangement. At completion, cable and asset management software shall reflect as-built conditions.
- G. Use logical and systematic designations for facility's architectural arrangement and nomenclature, and a consistent color-coded identification of individual conductors.

H. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Label each terminal strip and screw terminal in each cabinet.
  - a. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
  - b. Label each unit and field within distribution racks and frames.

- I. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

3.10 GRAPHICS ORGANIZATION

A. General:

1. Graphics shall be full color with motion utilizing floor plans wherever possible to indicate location of applicable information and fully accessible through the web-based software.
2. A general color scheme shall be utilized to indicate status of equipment and information.
  - a. BLUE: Equipment/system normal, off; point normal.
  - b. GREEN: Equipment/system normal, on.
  - c. YELLOW: Equipment/system alarm, operating; point minor alarm.
  - d. RED: Equipment failure; point major alarm.
  - e. PURPLE: Operator override.
3. Provide the following links in a block in the same general location on every graphic:
  - a. Primary graphic.
  - b. All screens associated with the current graphic.
  - c. As-Built Sequence of Operation
  - d. Back to previous.
  - e. Forward to next.
4. Organize graphics in easily understandable levels to minimize search time for desired information.
  - a. There shall be at least 2 levels and no more than 4 levels.
  - b. Smaller systems can have one primary graphic with links to all other graphics.
  - c. Larger systems can be organized with one primary graphic, a secondary set of categorized graphics to organize like specific graphics (i.e., zones, air systems, chilled water systems, hot water systems, etc.), then a third layer to take the user to specific graphics.

- B. Primary Graphic:
1. The primary graphic will show well organized links to all other graphic levels with short descriptive labels.
  2. Import the Owner's logo and clearly show the project name.
- C. Zone Graphics:
1. Provide floor plan based graphics to show zones. Organize in a similar fashion to Contract Drawings and provide a sufficient scale so all information is easily readable and understandable.
  2. Provide links to all other zone graphics.
  3. Provide links to all individual zone terminal equipment.
  4. Show all zone terminal equipment information with blocks in the associated zone. Each block shall change color to indicate normal/alarm modes.
- D. System Graphics:
1. Each discreet system shall have a single graphic organized in schematic form accurately representing the installation configuration.
  2. Each system or piece of equipment that has been provided with 2-way communications such as through an RS 485 connection shall be provided with a dedicated graphic regardless of which contract it was provided under or if it was Owner/tenant provided.
  3. Provide links to all associated graphics (i.e., AHU to other AHU's and to exhaust systems, chilled water system to cooling tower system and hot water system).
  4. Locate pertinent information next to its associated graphic representation.
  5. Provide a link to a separate page that displays the system as-built sequence of operation.
- E. Monitoring Graphics:
1. Where equipment is monitored for specific information and no 2-way communication is available, it may be grouped on a floor plan or multiple plans.
- F. Show the block in its general location with an equipment label and normal and alarm color changing.
- G. Custom Graphics: Custom graphic files shall be created with the use of a graphics generation package furnished with the system. The graphics generation package shall be a graphically based system that uses the mouse to create and modify graphics that are saved in industry standard formats such as PCX, TIFF, and GEM. The graphics generation package also shall provide the capability of capturing or converting graphics from other programs such as Designer or AutoCAD.
- H. Graphics Library: Furnish a complete library of standard HVAC equipment graphics such as chillers, boilers, air handlers, terminals, fan coils, and unit ventilators. This library also shall include standard symbols for other equipment including fans, pumps, coils, valves, piping, dampers, and ductwork. The library shall be furnished in a file format compatible with the graphics generation package program.

3.11 PROGRAMMING

- A. Provide sufficient internal memory for the specified sequences of operation and trend logging. There shall be a minimum of 25% of available memory free for future use.
  
- B. Point Naming: System point names shall be modular in design, allowing easy operator interface without the use of a written point index. Use the following naming convention: AA.BBB.CCDDE where AA is used to designate the location of the point within the building, such as mechanical room, wing, or level, or the building itself in a multi-building environment, BBB is used to designate the mechanical system with which the point is associated (e.g., A01, HTG, CLG, LTG), CC represents the equipment or material referenced (e.g., SF for supply fan, RW for return water, EA for exhaust air, ZN for zone), D or DD may be used for clarification or for identification if more than one CC exists (e.g., SF10, ZNB), E represents the action or state of the equipment or medium (e.g., T for temperature, H for humidity, C for control, S for status, D for damper control, I for current).
  
- C. Software Programming:
  - 1. Provide programming for the system and adhere to the sequences of operation provided. All other system programming necessary for the operation of the system, but not specified in this document, also shall be provided by the Contractor. Imbed into the control program sufficient comment statements to clearly describe each section of the program. The comment statements shall reflect the language used in the sequences of operation. Use the appropriate technique based on the following programming types:
    - a. Text-based:
      - 1) Organized in single purpose blocks of programming.
      - 2) Must provide actions for all possible situations.
      - 3) Must be modular and structured.
      - 4) Must be commented with a description and purpose.
  
    - b. Graphic-based:
      - 1) Organized in single purpose functional blocks.
      - 2) Must provide actions for all possible situations.
      - 3) Organize blocks in a neat flowing structure.
      - 4) Blocks must be annotated with a description and purpose in a text block.
      - 5) Must be documented.
  
- D. Operator Interface:
  - 1. Standard Graphics: Provide graphics for all mechanical systems and floor plans of the building. This includes each chilled water system, hot water system, chiller, boiler, air handler, and all terminal equipment. Point information on the graphic displays shall dynamically update. Show on each graphic all input and output points for the system. Also show relevant calculated points such as set points.
  - 2. Show terminal equipment information on a "graphic" summary table. Provide dynamic information for each point shown.
  - 3. The Contractor shall provide all the labor necessary to install, initialize, start up, and troubleshoot all operator interface software and its functions as described in this Section.

This includes any operating system software, the operator interface database, and any third party software installation and integration required for successful operation of the operator interface.

### 3.12 ADJUSTING

#### A. Calibrating and Adjusting:

1. Coordinate onsite time and integration of services with Division 23 Section "Testing, Adjusting, and Balancing of HVAC" to utilize and mutually support activities. Air and water devices requiring flow information for calibration (i.e., VAV box, flow station/meters, etc.) shall be calibrated in conjunction with TAB activities and shall not interfere with the work and general schedule of construction.
2. Calibrate instruments.
3. Make single-point calibration test for accuracy, plus testing of full span for each analog instrument.
4. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
5. Control System Inputs and Outputs:
  - a. Check analog inputs at 0, 50, and 100 percent of span.
  - b. Check analog outputs using milliampere meter at 0, 50, and 100 percent output.
  - c. Check digital inputs using jumper wire.
  - d. Check digital outputs using ohmmeter to test for contact making or breaking.
  - e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.
6. Flow:
  - a. Set differential pressure flow transmitters for 0 and 100 percent values with single-point calibration accomplished at approximately mid-point of span, and check full span with an artificial signal generator.
  - b. Manually operate flow switches to verify that they make or break contact.
7. Pressure:
  - a. Calibrate pressure transmitters at approximately mid-point of span, and check full span with an artificial signal generator.
  - b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.
8. Temperature:
  - a. Calibrate resistance temperature transmitters at approximately mid-point of span using a precision-resistance source, and check full span with an artificial signal generator.
  - b. Calibrate temperature switches to make or break contacts.
9. Stroke and adjust control valves and dampers, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.



10. Provide diagnostic and test instruments for calibration and adjustment of system.
11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

B. Adjust initial temperature and humidity set points.

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three visits to Project during other than normal occupancy hours for this purpose.

### 3.13 FIELD QUALITY TESTING

A. Perform the following field tests and inspections and prepare test reports:

1. Category 5e UTP Cabling Tests:

- a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in Annex I, complying with measurement accuracy specified in Annex H. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
- b. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
- c. Wire-map test that reports open circuits, short circuits, crossed pairs, reversed pairs, split pairs, and improper terminations.
- d. Channel and permanent link tests for cable length, insertion loss, near-end crosstalk loss, power sum near-end crosstalk loss, equal-level far-end crosstalk loss, power sum equal-level far-end crosstalk, return loss, propagation delay, and delay skew. Performance shall comply with minimum criteria in TIA/EIA-568-B.2.

2. Category 6 UTP Cabling Tests:

- a. Tests shall include all tests of Category 5e, conducted from 1 to 250 MHz.
- b. Channel and permanent link tests shall be performed with a tester that complies with performance requirements in TIA/EIA-568-B.2, Level III. Include tests for longitudinal or transverse conversion loss.
- c. Performance shall comply with minimum criteria in TIA/EIA-568-B.2.

B. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

C. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

D. Retest and inspect cabling to determine compliance of replaced or additional work with specified requirements.

### 3.14 STABILITY TRENDING SET-UP

A. Set up trending of points for confirmation of stability and control.

- B. Trend three weeks of data as follows:
  - 1. Trend all analog input values on a 30 minute basis.
  - 2. Trend all digital input points on a change of value basis.
  - 3. Trend all analog virtual points on a 60 minute basis.
- C. Test network capacity according to standards indicated during trending tests.
- D. When trending indicates system instability for certain points, set-up additional trending for one week as follows to facilitate tuning and trouble-shooting:
  - 1. Trend all associated analog input points on a 10 minute basis.
  - 2. Trend all associated digital input points on a change of value basis.
  - 3. Trend all associated analog outputs on a 10 minute basis.
  - 4. Trend all associated digital outputs on a change of value basis.
  - 5. Trend all associated virtual analog points on a 10 minute basis.
  - 6. Trend all associated virtual digital points on a change of value basis.
- E. Reporting system shall automatically email trend reports to the Engineer and the Commissioning Agent on a daily basis.
- F. Continue trending as long as required to enable system stability and trouble shooting. Owner's representative must sign off.
- G. Leave trending of point as directed by Owner's representative for long term information gathering.

### 3.15 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. Refer to Division 01 for additional requirements.

END OF SECTION 230900  
01/09/2017

## 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. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:
  - 1. Condenser-water piping.
  - 2. Makeup-water piping.
  - 3. Cooling tower drain piping.
  - 4. Air-vent piping.

### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
  - 1. Pressure-seal fittings.
  - 2. Grooved end mechanical joint fittings.
  - 3. Air control devices.
  - 4. Hydronic specialties.
- B. Shop Drawings: Detail, CAD-generated and drawn at 1/4-inch scale, the piping layout, fabrication of piping systems, pipe anchors, hangers, valves, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to the building structure and seismic restraints. Detail location of anchors, alignment guides, and expansion joints and loops.
  - 1. Fabrication, assembly and installation including plans, elevations, sections, components, and attachments to other work.
  - 2. Equipment installation based on equipment being used on project.
  - 3. Piping accessories, including access panels.
  - 4. Grooved joint couplings and fittings shall be shown on drawings and product submittals, and be specifically identified with the applicable style or series number.

### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Welding certificates.
- C. Field quality-control test reports.
- D. Chemical Removal Certificates: Written and signed certificates from a licensed hazardous chemical removal company.

1. Written, signed approval from the appropriate agencies, water/sewer authorities, and Owner may be substituted for chemical removal where noted herein.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

#### 1.6 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
  1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for hydronic systems 350 psig and/or 250 deg F and below, for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 01.
- D. Installer Qualifications:
  1. Installer of Pressure-Sealed Joints and Grooved-End Mechanical Joint Systems: Installers shall be certified by the pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings. Submit certifications or letter listing specific names of installers.

### PART 2 - PRODUCTS

#### 2.1 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tubing: ASTM B 88, Type L.
- B. Annealed-Temper Copper Tubing: ASTM B 88, Type K.
- C. Wrought-Copper Fittings: ASME B16.22.
- D. Wrought-Copper Unions: ASME B16.22.

E. Copper or Bronze Pressure-Seal Fittings:

1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
  - a. NIBCO.
  - b. Tyco International Company; Grinnell Mechanical Products.
  - c. Victaulic Inc.
  - d. Viega.
2. Housing: Copper.
3. O-Rings and Pipe Stops: EPDM.
4. Tools: Manufacturer's special tools.
5. Minimum 200-psig working-pressure rating at 250 deg. F.

2.2 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.
- B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in Part 3 "Piping Applications" Article.
- C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.
- D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.
- E. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
- F. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
  1. Material Group: 1.1.
  2. End Connections: Butt welding.
  3. Facings: Raised face.
- G. Grooved Mechanical-Joint Fittings and Couplings:
  1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
    - a. Anvil International, Inc.
    - b. Tyco International Company; Grinnell Mechanical Products.
    - c. Victaulic Company.
  2. Grooved Joint Fittings NPS 2 and Larger: ASTM A 536, Grade 65-45-12 ductile-iron; ASTM A 53/A 53M, Type F, E or S, Grade B fabricated steel; or ASTM A234, Grade WPB forged steel fittings with grooves or shoulders constructed to accept grooved-end

- couplings; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
3. Couplings NPS 2 and Larger: Two-piece, ductile-iron housing and synthetic rubber gasket of central cavity pressure-responsive design (similar to Grade "EHP" EPDM for water services rated -30 deg. F to +250 deg. F); with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
  4. Flange Adapters: Ductile-iron housing, flat face, for use with grooved-end pipe and fittings, for mating directly with ANSI Class 125, 150 and 300 flanges.

### 2.3 JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
  1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
    - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
    - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
- B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- D. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.
- E. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- F. Gasket Material: Thickness, material, and type suitable for fluid to be handled and working temperatures and pressures.

### 2.4 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Capitol Manufacturing Company.
    - b. Central Plastics Company.
    - c. Hart Industries International, Inc.
    - d. Jomar International Ltd.
    - e. Matco-Norca, Inc.
    - f. McDonald, A. Y. Mfg. Co.
    - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

- h. Wilkins; a Zurn company.
2. Description:
- a. Standard: ASSE 1079.
  - b. Pressure Rating: 150 psig.
  - c. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. Matco-Norca, Inc.
  - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - e. Wilkins; a Zurn company.
2. Description:
- a. Standard: ASSE 1079.
  - b. Factory-fabricated, bolted, companion-flange assembly.
  - c. Pressure Rating: 150 psig.
  - d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric-Flange Insulating Kits:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Advance Products & Systems, Inc.
  - b. Calpico, Inc.
  - c. Central Plastics Company.
  - d. Pipeline Seal and Insulator, Inc.
2. Description:
- a. Nonconducting materials for field assembly of companion flanges.
  - b. Pressure Rating: 150 psig.
  - c. Gasket: Neoprene or phenolic.
  - d. Bolt Sleeves: Phenolic or polyethylene.
  - e. Washers: Phenolic with steel backing washers.
- E. Dielectric Nipples:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Elster Perfection.

- b. Grinnell Mechanical Products.
- c. Matco-Norca, Inc.
- d. Precision Plumbing Products, Inc.
- e. Victaulic Company.

2. Description:

- a. Standard: IAPMO PS 66
- b. Electroplated steel nipple. complying with ASTM F 1545.
- c. Pressure Rating: 300 psig at 225 deg F.
- d. End Connections: Male threaded or grooved.
- e. Lining: Inert and noncorrosive, propylene.

2.5 AIR CONTROL DEVICES

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

- 1. Amtrol, Inc.
- 2. Armstrong Pumps, Inc.
- 3. Bell & Gossett Domestic Pump; a division of ITT Industries.
- 4. Taco.

B. Manual Air Vents:

- 1. Body: Bronze.
- 2. Internal Parts: Nonferrous.
- 3. Operator: Screwdriver or thumbscrew.
- 4. Inlet Connection: NPS 1/2.
- 5. Discharge Connection: NPS 1/8.
- 6. CWP Rating: 150 psig.
- 7. Maximum Operating Temperature: 225 deg F.

2.6 HYDRONIC PIPING SPECIALTIES

A. Stainless-Steel Bellow, Flexible Connectors:

- 1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
- 2. End Connections: Threaded or flanged to match equipment connected.
- 3. Performance: Capable of 3/4-inch misalignment.
- 4. CWP Rating: 150 psig.
- 5. Maximum Operating Temperature: 250 deg. F.



## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS

- A. Condenser-water and drain piping, aboveground, NPS 2-1/2 and larger, shall be the following:
  - 1. All Locations Unless Noted Otherwise: Schedule 40 steel pipe, wrought-steel fittings and Class 150 forged-steel flanges and flange fittings, and welded and flanged joints.
  - 2. Exposed and Accessible Locations Unless Noted Otherwise: Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings.
- B. Makeup-water piping installed aboveground shall be the following:
  - 1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or pressure seal joints.
- C. Cooling Tower Drain Piping:
  - 1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or pressure seal joints, 45-degree tees and cleanouts.
- D. Air-Vent Piping:
  - 1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to the piping manufacturer's written instructions.
  - 2. Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.

### 3.2 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.

- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- L. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- O. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- P. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- Q. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.
- R. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, in-line pump, and elsewhere as indicated. Install NPS 3/4 nipple and ball valve in blowdown connection of strainers NPS 2 and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2.
- S. Install unions in pipes 2 inches NPS and smaller, adjacent to each valve, at final connections of each piece of equipment and elsewhere as indicated. Unions are not required at flanged connections.
- T. Install flanges on valves, apparatus and equipment having 2-1/2 inches NPS and larger connections.
- U. Install flexible connectors at inlet and discharge connections to cooling tower and other vibration producing equipment.
- V. Anchor piping for proper direction of expansion and contraction.
- W. Identify piping as specified in Division 23 Section "Identification for HVAC Piping and Equipment."
- X. Install sleeves for piping penetrations of walls. Comply with requirements for sleeves specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."

### 3.3 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor devices are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment." Comply with the following requirements for

maximum spacing of supports. Piping supports must account and contraction, vibration, seismic restraint, and dead load of piping and its contents.

- B. Seismic restraints are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."
- C. Install the following pipe attachments:
  - 1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
  - 2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
  - 3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
  - 4. Spring hangers to support vertical runs to support horizontal runs for first three support points from all equipment and support points up to 50 linear feet from all rotating type equipment.
  - 5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes and in accordance with MSS-SP-69:
  - 1. NPS 3/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
  - 2. NPS 1: Maximum span, 7 feet; minimum rod size, 3/8 inch.
  - 3. NPS 1-1/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
  - 4. NPS 1-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
  - 5. NPS 2: Maximum span, 10 feet; minimum rod size, 3/8 inch.
  - 6. NPS 2-1/2: Maximum span, 11 feet; minimum rod size, 3/8 inch.
  - 7. NPS 3: Maximum span, 12 feet; minimum rod size, 3/8 inch.
  - 8. NPS 4: Maximum span, 14 feet; minimum rod size, 1/2 inch.
  - 9. NPS 6: Maximum span, 17 feet; minimum rod size, 1/2 inch.
  - 10. NPS 8: Maximum span, 19 feet; minimum rod size 5/8 inch.
- E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes and in accordance with MSS-SP-69:
  - 1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 3/8 inch.
  - 2. NPS 1: Maximum span, 6 feet; minimum rod size, 3/8 inch.
  - 3. NPS 1-1/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
  - 4. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
  - 5. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
  - 6. NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 1/2 inch.
  - 7. NPS 3: Maximum span, 10 feet; minimum rod size, 1/2 inch.
- F. Support vertical runs at roof, and at 10-foot intervals between floors.

### 3.4 PIPE JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Braze Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Mechanically Formed, Copper Tube Outlet Joints: Use manufacturer recommend tool and procedure, and brazed joints.

### 3.5 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

### 3.6 CHEMICAL DISPOSAL

- A. Removal of Chemicals from Site: Chemicals will be disposed of off-site by a licensed hazardous chemical waste company.
  - 1. Provide written and signed certification of proper disposal.
- B. Alternative Disposal: If all approvals and acceptances are obtained, chemicals may be disposed of through the building sanitary system.
  - 1. Written and Signed Approvals/Acceptances:
    - a. Owner.
    - b. Water/Sewer Authority.
    - c. Other Authorities Having Jurisdiction.

2. Monitoring: Effluent shall be continually monitored during all disposal events for all restrictive allowable variables (e.g., pH level) outline in the specific approvals and acceptances gained.

### 3.7 FIELD QUALITY CONTROL

#### A. Prepare hydronic piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
3. Chemically clean and Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens. After cleaning and flushing hydronic piping systems, but before balancing, remove disposable fine-mesh strainers in pump suction diffusers.
4. Isolate equipment from piping. Install valves, caps or blinds in flanged joints at final equipment connection points to isolate equipment. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

#### B. Perform the following tests on hydronic piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
3. Determine that hydronic system is full of water.
4. Subject piping system up to equipment final connection points to hydrostatic test pressure of 1.5 times the system's working pressure, minimum 100 psig but shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A in ASME B31.9, "Building Services Piping." Expansion joints which cannot sustain the reactions due to test pressure shall be provided with temporary restraint or shall be isolated from testing.
5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
6. Prepare written report of testing.

#### C. Test and inspect field welds are follows:

1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field inspections and tests, and to prepare test reports.
2. Provide the testing agency and the Engineer safe access to the site throughout the duration of the piping installation. Notify the testing agency and the Engineer a minimum of 48 hours prior to start of welding.

3. Field welds will be tested and inspected according to ASME B31.9 for hydronic distribution systems 350 psig and/or 250 deg F and below, and the inspection procedures listed below:
    - a. Visual Inspection: Visual inspection on 100 percent of all field pipe welds. The percentage of welds inspected may be modified by the Engineer of Record, depending on initial results. Witness of the actual welding by the testing agency to occur on a minimum of 15 percent of all field welds.
  4. Correct deficiencies in or remove and replace welds that test reports and inspections indicate do not comply with the Contract Documents at no additional cost to the Owner.
  5. Additional testing and inspection, at the Contractor's expense, will be performed by the Owner's testing agency to determine compliance of corrected work with specified requirements.
- D. Test and inspect grooved-end piping assemblies as follows:
1. Testing Agency: Engage a direct factory employee or factory trained field representative to perform field inspections and tests, and to prepare test reports. Provide a letter from the manufacturer certifying the individual to perform the inspections and tests.
  2. Provide the testing agency and the Engineer safe access to the site throughout the duration of the piping installation. Notify the testing agency and the Engineer a minimum of two weeks prior to start of pipe system assembly.
  3. Field welds will be tested and inspected according to ASME B31.9 for hydronic distribution systems 350 psig and/or 250 deg. F and below, and the inspection procedures listed below:
    - a. Visual Inspection: Visual inspection of all field pipe joints.
  4. Correct deficiencies in or remove and replace joints that test reports and inspections indicate do not comply with the Contract Documents at no additional cost to the Owner.
  5. Additional testing and inspection, at the Contractor's expense, will be performed by the testing agency to determine compliance of corrected work with specified requirements.
- E. Comply with ASTM D 3370 and with the following standards:
1. Silica: ASTM D 859.
  2. Acidity and Alkalinity: ASTM D 1067.
  3. Iron: ASTM D 1068.
  4. Water Hardness: ASTM D 1126.
- F. Perform the following before operating the system:
1. Open manual valves fully.
  2. Inspect pumps for proper rotation.
  3. Set makeup pressure-reducing valves for required system pressure.
  4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
  5. Set temperature controls so all coils are calling for full flow.
  6. Inspect and set operating temperatures of hydronic equipment, such as chillers and cooling towers, to specified values.

7. Verify lubrication of motors and bearings.

END OF SECTION 232113  
08/19/2016

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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. This Section includes the following HVAC water-treatment systems:
  - 1. Biocide, chemical-feed equipment and conductivity controls.
  - 2. Chemical treatment test equipment.
  - 3. HVAC water-treatment chemicals.
  - 4. Cleaning of systems.
  - 5. Chemicals.

### 1.3 SUPPLEMENTAL BID

- A. Supplemental Bid No. 2: Add cost to provide cooling tower water treatment system as specified herein. Include in Base Bid initial cleaning/flushing of new piping system and initial water quality testing/report with recommendations for required treatment systems.

### 1.4 DEFINITIONS

- A. EEPROM: Electrically erasable, programmable read-only memory.
- B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
- C. TDS: Total dissolved solids.

### 1.5 PERFORMANCE REQUIREMENTS

- A. Water quality for HVAC systems shall minimize corrosion, scale buildup, and biological growth for optimum efficiency of HVAC equipment without creating a hazard to operating personnel or the environment.
- B. Base HVAC water treatment on quality of water available at Project site, HVAC system equipment material characteristics and functional performance characteristics, operating personnel capabilities, and requirements and guidelines of authorities having jurisdiction.
- C. Maximum Legionella Level for all Systems: 100 cfu/milliliter.
- D. Closed hydronic systems, including condenser water, shall have the following water qualities:
  - 1. pH: Maintain a value within 8.0 to 10.0.
  - 2. "P" Alkalinity: Maintain a value within 100 to 500 ppm.
  - 3. "M" Alkalinity: Maintain a value within 100 to 500 ppm.

4. Boron: Maintain a value within 100 to 200 ppm.
  5. Chemical Oxygen Demand: Maintain a maximum value of 100 ppm.
  6. Soluble Copper: Maintain a maximum value of 0.20 ppm.
  7. TDS: Maintain a maximum value of 1000 ppm.
  8. Ammonia: Maintain a maximum value of [20] ppm.
  9. Free Caustic Alkalinity: Maintain a maximum value of 20 ppm.
  10. Specific Conductance: Maintain a maximum value of 2500.
  11. Silica: Maintain a maximum value of 120 ppm.
  12. Molybdenum: Maintain a value within 100 to 250 ppm.
  13. Nitrite: Maintain a value within 600 to 1000 ppm.
  14. Microbiological Limits:
    - a. Total Aerobic Plate Count: Maintain a maximum value of 1000 organisms/ml.
    - b. Total Anaerobic Plate Count: Maintain a maximum value of 100 organisms/ml.
    - c. Nitrate Reducers: Maintain a maximum value of 100 organisms/ml.
    - d. Sulfate Reducers: Maintain a maximum value of 0 organisms/ml.
    - e. Iron Bacteria: Maintain a maximum value of 0 organisms/ml.
- E. Open hydronic systems, including fluid-cooler spray water, shall have the following water qualities:
1. pH: Maintain a value within 7.5 to 8.9.
  2. "P" Alkalinity: Maintain a maximum value of 100 ppm.
    - a. "M" Alkalinity: Maintain a maximum value of 600 ppm,
  3. Chemical Oxygen Demand: Maintain a maximum value of 100 ppm.
  4. Soluble Copper: Maintain a maximum value of 0.20 ppm.
  5. Specific Conductance: Maintain a maximum value of 1000.
  6. Ammonia: Maintain a maximum value of 20 ppm.
  7. Free "OH" Alkalinity: Maintain a maximum value of 0 ppm
  8. Microbiological Limits:
    - a. Total Aerobic Plate Count: Maintain a maximum value of 10,000 organisms/ml.
    - b. Total Anaerobic Plate Count: Maintain a maximum value of 1000 organisms/ml.
    - c. Nitrate Reducers: Maintain a maximum value of 100 organisms/ml.
    - d. Sulfate Reducers: Maintain a maximum value of 0 organisms/ml.
    - e. Iron Bacteria: Maintain a maximum value of 0 organisms/ml.
  9. Polymer Testable: Maintain a minimum value within 10 to 40.
- F. Passivation for Galvanized Steel: For the first 60 days of operation.
1. pH: Maintain a value within 7 to 8.
  2. Calcium Carbonate Hardness: Maintain a value within 100 to 300 ppm.
  3. Calcium Carbonate Alkalinity: Maintain a value within 100 to 300 ppm.

1.6 ACTION SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for the following products:
1. Water meters; make-up and bleed.
  2. Inhibitor injection timers.
  3. pH controllers.
  4. TDS controllers.
  5. Biocide feeder timers.
  6. Chemical solution tanks.
  7. Chemical injection pumps.
  8. Chemical test equipment.
  9. Chemical safety data sheets.
- B. Shop Drawings: Pretreatment and chemical treatment equipment showing tanks, maintenance space required, and piping connections to HVAC systems. Include plans, elevations, sections, details, and attachments to other work.
1. Wiring Diagrams: Power and control wiring.

1.7 INFORMATIONAL SUBMITTALS

- A. Field quality-control test reports.
- B. Other Informational Submittals:
1. Water-Treatment Program: Written sequence of operation on an annual basis for the application equipment required to achieve water quality defined in the "Performance Requirements" Article above.
  2. Preliminary Water Analysis: Illustrate water quality available at Project site.
  3. Post Cleaning Water Analysis: Illustrate that the entire system is free of cleaning chemicals prior to initiation of water treatment.
  4. Passivation Confirmation Report: Verify passivation of galvanized-steel surfaces, and confirm this observation in a letter to Architect.
  5. Post Initial Treatment Report: Verify that the water quality and legionella of each system is within specified limits in a letter to the Architect.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sensors, chemical injection pumps, water meters, bleed valve and controller to include in emergency, operation, and maintenance manuals.

1.9 QUALITY ASSURANCE

- A. HVAC Water-Treatment Service Provider Qualifications: An experienced HVAC water-treatment service provider capable of analyzing water qualities, installing water-treatment equipment, and applying water treatment as specified in this Section.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1.10 MAINTENANCE SERVICE

- A. Scope of Maintenance Service: Provide chemicals and service program to maintain water conditions required above to inhibit corrosion, scale formation, and biological growth for piping and cooling tower (closed-circuit cooler type) spray system and equipment. Services and chemicals shall be provided for a period of one year from date of Substantial Completion, and shall include the following:
  - 1. Initial water analysis and HVAC water-treatment recommendations.
  - 2. Startup assistance for Contractor to flush the systems, clean with detergents, and initially fill systems with required chemical treatment prior to operation.
  - 3. Quarterly customer report charts and log sheets.
  - 4. Quarterly certified laboratory technical analysis.
  - 5. Annual certified laboratory legionella analysis.
  - 6. Analyses and reports of all chemical items concerning safety and compliance with government regulations.
  - 7. Monthly service to test all system levels along with written reports.
  - 8. Quarterly coupon replacements.
  - 9. Monthly maintenance on all equipment.
  - 10. Handling of all chemicals (Owner will not handle chemicals).

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Nalco Water
  - 2. Ashland.
  - 3. Barclay Chemical Co.; Water Management, Inc.
  - 4. DuBois Chemical.
  - 5. GEWT - General Electrical Water Treatment Co.

#### 2.2 AUTOMATIC CHEMICAL-FEED EQUIPMENT

- A. Water Meter:
  - 1. AWWA C701, turbine-type, totalization meter.
  - 2. Body: Bronze.
  - 3. Minimum Working-Pressure Rating: 100 psig.
  - 4. Maximum Pressure Loss at Design Flow: 3 psig.
  - 5. Registration: Gallons or cubic feet.
  - 6. End Connections: Threaded.
  - 7. Control: Low-voltage signal capable of transmitting 1000 feet.

B. Inhibitor Injection Timers:

1. Microprocessor-based controller with LCD display in NEMA 250, Type 12 enclosure with gasketed and lockable door.

C. pH Controller:

1. Microprocessor-based controller, 1 percent accuracy in a range from zero to 14 units. Incorporate solid-state integrated circuits and digital LCD display in NEMA 250, Type 12 enclosure with gasketed and lockable door.
2. Digital display and touch pad for input.
3. Sensor probe adaptable to sample stream manifold.
4. High, low, and normal pH indication.
5. High or low pH alarm light, trip points field adjustable; with silence switch.
6. Hand-off-auto switch for acid pump.
7. Internal adjustable hysteresis or deadband.

D. TDS Controller:

1. Microprocessor-based controller, 1 percent accuracy in a range from zero to 9999 micromhos. Incorporate solid-state integrated circuits and digital LCD display in NEMA 250, Type 12 enclosure with gasketed and lockable door.
2. Digital display and touch pad for input.
3. Sensor probe adaptable to sample stream manifold.
4. High, low, and normal conductance indication.
5. High or low conductance alarm light, trip points field adjustable; with silence switch.
6. Hand-off-auto switch for solenoid bleed-off valve.
7. Bleed-off valve activated indication.
8. Internal adjustable hysteresis or deadband.
9. Bleed Valves:
  - a. Forged-brass body, globe pattern, general-purpose solenoid with continuous-duty coil, or motorized valve.
  - b. Zero pressure actuator

E. Biocide Feeder Timer:

1. Microprocessor-based controller with digital LCD display in NEMA 250, Type 12 enclosure with gasketed and lockable door.
2. 24-hour timer with 14-day skip feature to permit activation any hour of day.
3. Precision, solid-state, bleed-off lockout timer and clock-controlled biocide pump timer. Prebleed and bleed lockout timers.
4. Solid-state alternator to enable use of two different formulations.
5. 24-hour display of time of day.
6. 14-day display of day of week.
7. Battery backup so clock is not disturbed by power outages.
8. Hand-off-auto switches for biocide pumps.
9. Biocide A and Biocide B pump running indication.

- F. Chemical Solution Tanks:
  - 1. Chemical-resistant reservoirs fabricated from high-density opaque polyethylene with minimum 110 percent containment vessel.
  - 2. Molded cover with recess for mounting pump.
  - 3. Capacity: 30 gallon
- G. Chemical Solution Injection Pumps:
  - 1. Self-priming, positive-displacement; rated for intended chemical with minimum 25 percent safety factor for design pressure and temperature.
  - 2. Adjustable flow rate.
  - 3. Metal and thermoplastic construction.
  - 4. Built-in relief valve.
  - 5. Fully enclosed, continuous-duty, single-phase motor. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."
- H. Chemical Solution Tubing: Polyethylene tubing with compression fittings and joints compatible with all supplied chemistry.
- I. Injection Assembly:
  - 1. Quill: Minimum NPS 1/2 with insertion length sufficient to discharge into at least 25 percent of pipe diameter.
  - 2. Ball Valve: stainless steel as described in "Stainless-Steel Pipes and Fittings" Article below; and selected to fit quill.
  - 3. Packing Gland: Mechanical seal on quill of sufficient length to allow quill removal during system operation.
  - 4. Assembly Pressure/Temperature Rating: Minimum 600 psig at 200 deg F.
- J. Enclosures: Provide NEMA 4 enclosures suitable for outdoor use for all treatment equipment and controls not rated for outdoor use, mount.

## 2.3 CHEMICALS

- A. Chemicals shall be as recommended by water-treatment system manufacturer that are compatible with piping system components and connected equipment, and that can attain water quality specified in Part 1 "Performance Requirements" Article.
- B. Chemicals shall be EPA registered.
- C. All chemicals shall be environmentally preferred products acceptable for LEED accreditation.
- D. Scale and Corrosion Control in Systems Using Low and High Alkalinity Makeup: Phosphate-based to control white rust, mild steel, galvanized and yellow metal corrosion inhibition, containing no acid, chromate, zinc or molybdates.
- E. Microbiocide: Halogen and DBPNA based control of microbiological organisms, including slime and sulfate forming bacteria occurring in cooling towers and evaporative condensers.
  - 1. Environmental Impact: Degrades rapidly into non-toxic compounds.

2. Authorizations/Approvals: EPA registered.
- F. Low Temperature Precleaner for Cooling Systems:
1. Description: Cleaner is a low-viscosity, general-purpose, phosphate-free, alkaline cleaner for all systems.
  2. Use: Precleaning of oils, dirt and other materials present in piping, boilers, chillers and cooling towers.
  3. Properties: Low foaming, no VOC cleaning, safe for ferrous and nonferrous metals.
  4. Biodegradable.
- G. Cooling Tower Chlorinating Agent:
1. Concentrated dry chlorine source.
  2. Authorization/Approvals: EPA registered.
- H. Dispersant/Antifoulant:
1. Description: Low foaming dispersant for microbial, oil and sludge, adjunct to regular treatment.
  2. Authorizations/Approvals: EPA registered, USFA Code G-5.
- I. Sludge Conditioner:
1. Description: Synthetic polymer blend, sequestering agent, foulant deposit inhibitor.
  2. Authorizations/Approvals: USDA authorized for food contact steam.
- J. Corrosion Inhibitor:
1. Corrosion inhibitor that provides non-chromated protection to multi-metal systems operating at high or low temperatures. Acceptable for hot water heating systems (maximum 250 deg F), chilled water circuits and other closed systems containing ferrous and nonferrous metals.
  2. Closed systems only.
- K. Water Test Kit: Include water test kit in wall-mounting enclosure for hand held TDS, pH meter.

### PART 3 - EXECUTION

#### 3.1 WATER ANALYSIS

- A. Perform a certified laboratory analysis of the following:
1. Supply water to determine quality of water available at Project site.
  2. Water systems after cleaning and flushing to determine complete removal of cleaning chemicals prior to treatment.
  3. Water systems after treatment to determine compliance with required water quality.
  4. Water systems after treatment to determine compliance with required legionella levels.
  5. Retest if any tests fail.

- B. Perform onsite analysis of the following:
  - 1. Level 1, initial and final cleaning solution water to determine proper concentrations.

### 3.2 INSTALLATION

- A. Provide and install chemical application equipment in enclosures rated for outdoor use, level and plumb. Provide and mount on new galvanized support framing attached to cooling tower steel dunnage. Maintain manufacturer's recommended clearances. Arrange units so controls and devices that require servicing are accessible. Anchor chemical tanks and floor-mounting accessories to substrate.
- B. Install interconnecting control wiring for chemical treatment controls and sensors.
- C. Mount sensors and injectors in piping circuits.
- D. Install automatic chemical-feed equipment for fluid-cooler spray water and include the following:
  - 1. Install water meter in makeup water supply.
  - 2. Install inhibitor injection pumps and solution tanks with injection timer sensing contacts in water meter.
  - 3. Pumps shall operate for timed interval on contact closure at water meter in makeup water supply connection. Injection pump shall discharge into condenser water return line.
  - 4. Install test equipment and provide test-kit to Owner. Install test-coupon assembly in bypass circuit around circulating pumps, unless otherwise indicated on Drawings.
  - 5. Install TDS controller with sensor and bleed valves.
    - a. Bleed valves shall cycle to maintain maximum TDS concentration.
  - 6. Install pH sensor and controller with injection pumps and solution tanks.
    - a. Injector pumps shall operate to maintain required pH.
  - 7. Install biocide feeder alternating timer with two sets of injection pumps and solution tanks.
    - a. Injection pumps shall operate to feed biocide on an alternating basis.

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Make piping connections between HVAC water-treatment equipment and dissimilar-metal piping with dielectric fittings. Dielectric fittings are specified in Division 23 "Hydronic Piping."
- D. Install shutoff valves on HVAC water-treatment equipment inlet and outlet.
- E. Confirm applicable electrical requirements in electrical Sections for connecting electrical equipment.



- F. Ground equipment according to Division 26 "Grounding and Bonding for Electrical Systems."
- G. Connect wiring according to Division 26 "Low-Voltage Electrical Power Conductors and Cables."

### 3.4 SYSTEM CLEANING PROCEDURES

#### A. Level 1 Cooling Tower Hyperchlorination Procedure:

1. Initiate heavy blowdown of cooling system at least 2 to 4 hours prior to Level 1 cleaning procedure. Observe all makeup water flow limitations, assuring the blowdown process does not exceed makeup capabilities. Target approximately half the normal targeted cycles of concentration prior to chemical addition if possible. It is important to increase inhibitor feed rate during this period of heavy bleed in order to maintain the same level of continuous protection of the system metallurgy and heat exchangers.
2. Comply with any plant health and safety requirements that might include any or all of the following PPE: full face shields, positive-pressure HEPA respirators, rated gloves, goggles, boots and protective body clothing prior to handling and applying chemicals.
3. Add antifoulant as recommended by approved water treatment consultant.. Circulate for approximately instructed. Be prepared to add defoamer should foaming become excessive.
4. Shut off all bleed valves and add cooling tower chlorinating agent initially at the rate of ~3.0 ounces per 1,000 gallons system volume. This should provide approximately 12 ppm available chlorine to the water. Depending on the demand, a chlorine residual may be evident at this point. If this does not provide a residual of 5 to 10 ppm free chlorine, add cooling tower chlorinating agent in 1 ounce per 1,000 gallon increments, allowing adequate time for the system circulation to "turn-over" between additions. The inhibitor should be shut off during this time of no blowdown. Some conditions may require an initial dose of 25 to 50 ppm free chlorine, allowing it to fall to 5 to 10 ppm for the following several hours. Document and submit chlorine levels.
5. Circulate the system, with a target circulation time of at least 4 to 6 hours, but possibly up to 24 if conditions dictate, depending on the extent of contamination. If the time required exceeds the targeted 4 to 6 hours, full consideration should be given to reinitiating minimal bleed, as determined by need and discharge limits.
6. Maintain at least 5 ppm, but not more than 10 ppm free residual during the target time, through the periodic addition of cooling tower chlorinating agent as needed. If the system pH is greater than 8.0, chlorine residual should be maintained at the higher end of the range. Document and submit chlorine levels.
7. After the target circulation time, pull a sample for bio testing per protocol established for this system, for documentation of results of biocontrol after incubation. The results may indicate the need to repeat the process.
8. Depending on discharge requirements, it may be possible to return to normal blowdown process, allowing the gradual reduction of chlorine residual, but in many cases, it may be necessary to either:
  - a. Hold system water without blowdown until chlorine residual falls below acceptable levels, or;
  - b. Dechlorinate the system water prior to releasing the blowdown, through the addition of a suitable bisulfate or sulfite material, at the rate of ~2.5 ppm active sulfite per 1 ppm free chlorine residual.
  - c. Document and submit chlorine levels.

9. Following the chlorination and subsequent dechlorination process described above, return to normal blowdown rates, to reestablish normal cycles of concentration and inhibitor levels.

B. Cleaning and Passivation Procedures for Pipe Systems:

1. Drain the entire system completely from as many points as possible. Install a water meter on the system makeup and re-fill the system. Record the volume of the system. Provide chemical manufacturer with that volume for use in calculating the appropriate concentration of cleaner and inhibitor.
2. Introduce into the system via the filter/feeder or transfer pump alkaline new pipe cleaner.
3. The alkaline new pipe cleaner should be thoroughly circulated for 8 to 24 hours with all circulator pumps running and all valves open. There should be no isolated areas or "dead legs." It is essential to have good thorough circulation for the cleaning process. A sample of the system water with cleaner should be retained for the chemical manufacturer. That sample will be tested by the chemical manufacturer to determine if the proper concentration of cleaner is present.
4. After the cleaning process is complete, the system should be thoroughly drained and flushed. The system should be re-filled and a sample of the system water retained for the chemical manufacturer to test.
5. If the test indicates that the cleaner is still present, the system will require another complete drain and fill. A sample will be provided to the chemical manufacturer for testing again. This process will continue until the chemical manufacturer has determined that the cleaner is completely flushed from the system.
6. Time, materials, testing and retesting shall be included.
7. Once the chemical manufacturer has determined that the system is thoroughly flushed, a corrosion inhibitor should be introduced into the system via the filter/feeder or pump. The chemical manufacturer will specify the necessary amount to be used.
8. Circulate with all circulator pumps on and all valves open. A sample of the treated system water should be provided to the chemical manufacturer to determine the correct concentration of inhibitor. Once a proper concentration of inhibitor is present, circulation is to continue for three weeks for proper filming and passivation to occur.
9. Begin using the filter "bags" in the filter/feeder to remove any remaining suspended solids. The filters are to be changed weekly for three weeks. Filter sizes will also change from larger to smaller (20 micron, 10 micron and 5 micron) each week depending on the solids level.
10. A final sample of system water should be provided to the chemical manufacturer. The chemical manufacturer shall complete a laboratory analysis of the cleaned and treated water.

3.5 SYSTEM OPERATION

A. Chemical Feed Procedures:

1. Cooling tower inhibitor shall be fed by water meter pulse. This method will be based off of the load rather than timing (e.g., for every 10 gallons of water the chemical feed comes on for 10 seconds which will in turn provide 15 ppm of PO4.
2. Biocide pump runs off of timer with a 2-hour lockout so it can revert back to water before discharge. Halogen/DBPNA on alternating days shall be fed to attain a reading of 1-3 ppm and then a system lock shall be for two hours. The 2-hour lock will prevent the bleed of the biocide in the water and allow it to revert back to water before discharge. Biocide shall be fed once a day.

3. Self-cleaning filtration shall run off of pressure differential. A 7 psi difference in incoming and outgoing water will trigger an automatic back flush.
4. The controller will trigger an automatic bleed when the conductivity limit is reached causing the bleed solenoid to open to dilute the system water with fresh city makeup water.
5. The controller will notify alarms when there is no flow, conductivity is above/below limits and more. Please see technical data.
6. The controller will control all functions of the system including bleed, feed biocide feed and timing of all of these functions.

### 3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
  1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
  1. Inspect field-assembled components and equipment installation, including piping and electrical connections.
  2. Inspect piping and equipment to determine that systems and equipment have been cleaned, flushed, and filled with water, and are fully operational before introducing chemicals for water-treatment system.
  3. Place HVAC water-treatment system into operation and calibrate controls during the preliminary phase of HVAC systems' startup procedures.
  4. Do not enclose, cover, or put piping into operation until it is tested and satisfactory test results are achieved.
  5. Test for leaks and defects. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  6. Leave uncovered and unconcealed new, altered, extended, and replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
  7. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow test pressure to stand for four hours. Leaks and loss in test pressure constitute defects.
  8. Repair leaks and defects with new materials and retest piping until no leaks exist.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. At four-week intervals following Substantial Completion, during cooling tower operation season, perform separate water analyses on cooling tower spray systems to show that automatic chemical-feed systems are maintaining water quality within performance requirements specified in this Section. Submit written reports of water analysis advising Owner of changes necessary to adhere to Part 1 "Performance Requirements" Article.

F. Comply with ASTM D 3370 and with the following standards:

1. Silica: ASTM D 859.
2. Steam System: ASTM D 1066.
3. Acidity and Alkalinity: ASTM D 1067.
4. Iron: ASTM D 1068.
5. Water Hardness: ASTM D 1126.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC water-treatment systems and equipment.

END OF SECTION 232500

08/19/2016

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Closed-circuit, induced-draft, counterflow cooling towers.

1.3 SUPPLEMENTAL BID

- A. Supplemental Bid No. 1: Add cost to provide stainless steel basin/lower casing in lieu of galvanized steel basin/lower casing as specified herein.

1.4 DEFINITIONS

- A. BMS: Building management system.
- B. FRP: Fiber-reinforced polyester.

1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design cooling tower support structure and seismic restraints and wind restraints, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated. Refer to Division 23 "Vibration and Seismic Controls for HVAC Piping and Equipment" for performance requirements and design criteria.
- B. Structural Performance: Cooling tower support structure shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
- C. Seismic and Wind Performance: Cooling towers shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  - 2. Minimum 1 G-force for seismic.
  - 3. Minimum 60 psf wind rating.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, pressure drop, fan performance data, rating curves with selected points indicated, furnished specialties, and accessories.
1. Maximum flow rate.
  2. Minimum flow rate.
  3. Drift loss as percent of design flow rate.
  4. Volume of water in suspension for purposes of sizing a remote storage tank.
  5. Sound power levels in eight octave bands for operation with fans off, fans at minimum, and design speed.
  6. Performance curves for the following:
    - a. Varying entering-water temperatures from design to minimum.
    - b. Varying ambient wet-bulb temperatures from design to minimum.
    - c. Varying water flow rates from design to minimum.
    - d. Varying fan operation (off, minimum, and design speed).
  7. Fan airflow, brake horsepower, and drive losses.
  8. Pump flow rate, head, brake horsepower, and efficiency.
  9. Motor amperage, efficiency, and power factor at 100, 75, 50, and 25 percent of nameplate horsepower.
  10. Electrical power requirements for each cooling tower component requiring power.
  11. FMG approval and listing certification.
- B. Shop Drawings: Complete set of manufacturer's prints of cooling tower assemblies, control panels, sections and elevations, and unit isolation. Include the following:
1. Assembled unit dimensions.
  2. Weight and load distribution.
  3. Required clearances for maintenance and operation.
  4. Sizes and locations of piping and wiring connections.
  5. Wiring Diagrams: For power, signal, and control wiring, including remote power/control panel.
- C. Delegated-Design Submittal: For cooling tower support structure indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Detail fabrication and assembly of support structure.
  2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
  3. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and wind restraints and for designing vibration isolation bases.
- D. Coordination Drawings: Floor plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
1. Structural supports.

2. Piping roughing-in requirements.
  3. Wiring roughing-in requirements, including spaces reserved for electrical equipment.
  4. Access requirements, including working clearances for mechanical controls and electrical equipment, and tube pull and service clearances.
- E. Certificates: For certification required in "Quality Assurance" Article.
- F. Seismic Qualification Certificates: For cooling towers, accessories, and components, from manufacturers.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- G. Source quality-control reports.
- H. Field quality-control reports.
- I. Startup service reports.
- J. Operation and Maintenance Data: For each cooling tower to include in emergency, operation, and maintenance manuals.
- K. Warranty: Sample of special warranty.
- 1.7 QUALITY ASSURANCE
- A. Testing Agency Qualifications: Certified by CTI.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. ASHRAE/IESNA 90.1-2007 Compliance: Equipment shall meet or exceed the minimum efficiency requirements of the standard. Equipment shall bear a permanent label installed by the manufacturer stating that the equipment complies with the requirements of ASHRAE Standard 90.1.
- D. ASME Compliance: Fabricate and label heat-exchanger coils to comply with ASME/ANSI B31.5.
- E. CTI Certification: Cooling tower thermal performance according to CTI STD 201, "Certification Standard for Commercial Water-Cooling Towers Thermal Performance."
- F. FMG approval and listing in the latest edition of FMG's "Approval Guide."
- 1.8 COORDINATION
- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

- B. Coordinate sizes, locations, and anchoring attachments of structural-steel support structures.
- C. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

#### 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace the following components of cooling towers that fail in materials or workmanship within specified warranty period:
  - 1. Fan assembly including fan, drive, and motor.
  - 2. All components of cooling tower, except heat transfer coil.
  - 3. Warranty Period: Five years from date of Substantial Completion.

#### PART 2 - PRODUCTS

##### 2.1 CLOSED-CIRCUIT, INDUCED-DRAFT, COUNTERFLOW COOLING TOWERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. Evapco Inc.
  - 2. Marley.
  - 3. Baltimore Air Coil.
- B. FMG Listing Requirements:
  - 1. Provide screens on inside face of tower inlet louvers.
  - 2. Provide galvanized pipe spray distribution.
  - 3. Provide baffle between fan sections above the coil section.
- C. Fabricate cooling tower mounting base with reinforcement strong enough to resist cooling tower movement during a seismic event when cooling tower is anchored to field support structure.
- D. Cooling tower designed to resist wind load of 60 lbf/sq. ft.
- E. Casing and Frame:
  - 1. Base Bid: All galvanized construction with galvanized steel, ASTM A 653/653A 653M, G235 coating.
  - 2. Supplemental Bid No. 1: 316 Stainless steel lower section, galvanized steel upper section.
  - 3. Fasteners: Stainless steel.
  - 4. Joints and Seams: Sealed watertight.
  - 5. Welded Connections: Continuous and watertight.
  - 6. Fan Section Baffle: Between fan sections above coil section per FMG listing.
- F. Collection Basin:



1. Base Bid: Galvanized steel, ASTM A 653/A 653M, G235 coating.
  2. Supplemental Bid No. 1: 316 stainless steel.
  3. Overflow and drain connections.
  4. Makeup water connection.
  5. Pan Strainer: Stainless steel, large area removable perforated screens.
- G. Electric/Electronic, Collection Basin Water-Level Controller with Solenoid Valve:
1. Enclosure: NEMA 250, Type 4.
  2. Sensor: Solid-state controls with (5) stainless steel electrode probes and relays factory wired to a terminal strip ready for wiring to remote power/control panel to provide control of water makeup valve and low- and high-level control of water makeup valve, low- and high-level alarms, and output for shutoff of pump on low level.
  3. Electrode Probes: Stainless steel.
  4. Water Stilling Chamber: PVC pipe.
  5. Solenoid Valve: Slow closing; controlled and powered through level controller in response to water-level set point.
  6. Electrical Connection Requirements: 120 V, single phase, 60 Hz.
- H. Electric Basin Heater:
1. Stainless-Steel Electric Immersion Heaters: Installed in a threaded coupling on the side of the collection basin.
  2. Heater Control Panel: In factory provide remote power/control panel specified herein and including the following:
    - a. Enclosure: NEMA 250, Type 4.
    - b. Magnetic contactors controlled by a temperature sensor/controller to maintain collection basin water-temperature set point. Water-level probe shall monitor cooling tower water level and de-energize the heater when the water reaches low-level set point.
    - c. Control-circuit transformer with primary and secondary side fuses.
    - d. Terminal blocks with numbered and color-coded wiring to match wiring diagram.
    - e. Single-point, field-power connection from a fused disconnect switch in remote power/control panel.
    - f. Factory Wiring Method: Metal raceway for factory-installed wiring outside of enclosures, except make connections to each electric basin heater with liquidtight conduit.
- I. Pressurized Water Distribution Piping: Main header and lateral branch piping designed for even distribution over heat-exchanger coil or fill throughout the flow range without the need for balancing valves and for connecting individual, removable, nonclogging spray nozzles.
1. Pipe Material: Galvanized pipe per FMG listing requirements.
  2. Spray Nozzle Material: Galvanized per FMG listing requirements.
  3. Piping Supports: Corrosion-resistant hangers and supports to resist movement during operation and shipment.
- J. Recirculating Piping: PVC.
1. Bleed piping line with manual valve ready for extension.

- K. Spray Pump: Close-coupled, end-suction, single-stage, bronze-fitted centrifugal pump; with suction strainer and flow balancing valve, and mechanical seal suitable for outdoor service.
- L. General Requirements for Spray Pump Motor: Comply with NEMA designation and temperature-rating requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment" and not indicated below.
1. Motor Enclosure: Totally enclosed with protective enclosure.
  2. Energy Efficiency: NEMA Premium Efficient.
  3. Service Factor: 1.15.
- M. Heat-Exchanger Coils:
1. Tube and Tube Sheet Materials: Prime-coated steel tube and sheet with outer surface of tube and sheet hot-dip galvanized after fabrication.
  2. Heat-Exchanger Arrangement: Serpentine tubes with removable cover plate on inlet and outlet headers; and sloped for complete drainage of fluid by gravity.
  3. Field Piping Connections: Vent, supply, and return. Type coordinated with piping system being provided.
- N. Removable Drift Eliminator:
1. Material: PVC; with maximum flame-spread index of 5 according to ASTM E 84.
  2. UV Treatment: Inhibitors to protect against damage caused by UV radiation.
  3. Configuration: Multipass, designed and tested to reduce water carryover to achieve performance indicated.
- O. Air-Intake Louvers:
1. Material: PVC.
  2. UV Treatment: Treat louvers with inhibitors to protect against damage caused by UV radiation.
  3. Louver Blades: Arranged to uniformly direct air into cooling tower, to minimize air resistance, and to prevent water from splashing out during all modes of operation including operation with fans off.
  4. Screen: On inside face of intake louvers per FMG listing requirements.
- P. Axial Fan: Balanced at the factory after assembly.
1. Blade Material: Aluminum.
  2. Hub Material: Aluminum.
  3. Blade Pitch: Field adjustable.
  4. Protective Enclosure: Removable, galvanized-steel, wire-mesh screens complying with OSHA regulations.
  5. Fan Shaft Bearings: Self-aligning ball or roller bearings with moisture-proof seals and premium, moisture-resistant grease suitable for temperatures between minus 20 and plus 300 deg F. Bearings designed for an L-10 life of 100,000 hours.
  6. Bearings Grease Fittings: Extended lubrication lines to an easily accessible location.

- Q. Belt Drive:
1. Service Factor: 1.5 based on motor nameplate horsepower.
  2. Sheaves: Fan and motor shafts shall have taper-lock sheaves fabricated from corrosion-resistant materials.
  3. Belt: One-piece, multigrooved, solid-back belt.
  4. Belt Material: Oil resistant, nonstatic conducting, and constructed of neoprene polyester cord.
  5. Belt-Drive Guard: Comply with OSHA regulations.
- R. Fan Motor:
1. General Requirements for Fan Motors: Comply with NEMA designation and temperature-rating requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment" and not indicated below.
  2. Motor Enclosure: Totally enclosed. Suitable for most air operation..
  3. Energy Efficiency: NEMA Premium Efficient.
  4. Service Factor: 1.15.
  5. Insulation: Class F.
  6. Variable-Speed Motors: Inverter-duty rated per NEMA MG-1, Section IV, "Performance Standard Applying to All Machines," Part 31, "Definite-Purpose, Inverter-Fed, Polyphase Motors."
  7. Severe-duty rating with the following features:
    - a. Rotor and stator protected with corrosion-inhibiting epoxy resin.
    - b. Double-shielded, vacuum-degassed bearings lubricated with premium, moisture-resistant grease suitable for temperatures between minus 20 and plus 300 deg F.
  8. Motor Base: Adjustable, or other suitable provision for adjusting belt tension.
- S. Fan Discharge Stack: Material shall match casing, manufacturer's standard design.
1. Stack Termination: Wire-mesh, galvanized-steel screens; complying with OSHA regulations.
  2. Discharge Hood: Straight-sided galvanized discharge hood of same construction as unit upper casing with motorized low-leakage dampers, 120V single phase, ready for field wiring from remote power/control panel.
- T. Vibration Switch: For each fan drive.
1. Enclosure: NEMA 250, Type 4.
  2. Vibration Detection: Sensor with a field-adjustable, acceleration-sensitivity set point in a range of 0 to 1 g and frequency range of 0 to 3000 cycles per minute. Cooling tower manufacturer shall recommend switch set point for proper operation and protection.
  3. Provide switch with manual-reset button for field connection to a BMS and hardwired connection to fan motor electrical circuit from remote power/control panel.
  4. Switch shall, on sensing excessive vibration, signal an alarm through the BMS and shut down the fan.
- U. Remote Power/Control Panel: Stainless steel, NEMA 250, Type 4 panel housing unit main disconnect switch, power/control terminal blocks for tower components ready for field wiring,

spray pump motor controller with fuse HOS switch; electric basin heater fused disconnected switch heater contactor, control transformer, heater hand on/off with pilot light; 120V cold water level controller power/control; 120V discharge dampers power/control.

- V. Controls: Comply with requirements in Division 23 Section "Instrumentation and Control for HVAC."
- W. Personnel Access Components:
  - 1. Doors: Large enough for personnel to access cooling tower internal components from both cooling tower end walls. Doors shall be operable from both sides of the door.
  - 2. External Ladders with Safety Cages: Aluminum, ladders to access motor access door adjacent grade without the need for portable ladders. Comply with 29 CFR 1910.27.
  - 3. Internal Working Platform:
    - a. Internal working platforms shall provide easy access to the fans, belts, motors, sheaves, bearings, all mechanical equipment and complete water distribution system. The coil surface shall be an acceptable means of accessing these components.
  - 4. Basin Heater:
    - a. Basin Water Temperature: 40 deg F.
    - b. Outdoor Ambient Temperature: 0 deg F.

## 2.2 SOURCE QUALITY CONTROL

- A. Verification of Performance: Test and certify cooling tower performance according to CTI STD 201, "Certification Standard for Commercial Water-Cooling Towers Thermal Performance."
- B. Factory pressure test heat exchangers after fabrication and prove to be free of leaks.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Before cooling tower installation, examine roughing-in for tower support, anchor-bolt sizes and locations, piping, and electrical connections to verify actual locations, sizes, and other conditions affecting tower performance, maintenance, and operation.
  - 1. Cooling tower locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install cooling towers on support structure indicated.

- B. Equipment Mounting: Install cooling tower using elastomeric pads. Comply with requirements for vibration isolation devices specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."
  - 1. Minimum Deflection: 2 inches.
  - 2. Provide stainless-steel plate to equally distribute weight over elastomeric pad.
- C. Install anchor bolts to elevations required for proper attachment to supported equipment.
- D. Maintain manufacturer's recommended clearances for service and maintenance.
- E. Loose Components: Install electrical components, devices, and accessories that are not factory mounted.

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to cooling towers to allow service and maintenance.
- C. Install flexible pipe connectors at pipe connections of cooling towers mounted on vibration isolators.
- D. Provide drain piping with valve at cooling tower drain connections and at low points in piping.
- E. Connect cooling tower overflows and drains, and piping drains to sanitary sewage system.
- F. Domestic Water Piping: Connect to water-level control with shutoff valve and union, flange, or mechanical coupling at each connection.
- G. Supply and Return Piping: Comply with applicable requirements in Division 23 Section "Hydronic Piping." Connect to entering cooling tower connections with shutoff valve, balancing valve, thermometer, plugged tee with pressure gage, flow meter, and drain connection with valve. Connect to leaving cooling tower connection with shutoff valve. Make connections to cooling tower with a union, flange, or mechanical coupling.

### 3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to perform field tests and inspections.
- B. Tests and Inspections: Comply with CTI ATC 105, "Acceptance Test Code for Water Cooling Towers."
- C. Cooling towers will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.5 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.
- C. Obtain performance data from manufacturer.
  - 1. Complete installation and startup checks according to manufacturer's written instructions and perform the following:
    - a. Clean entire unit including basins.
    - b. Verify that accessories are properly installed.
    - c. Verify clearances for airflow and for cooling tower servicing.
    - d. Check for vibration isolation and structural support.
    - e. Lubricate bearings.
    - f. Verify fan rotation for correct direction and for vibration or binding and correct problems.
    - g. Adjust belts to proper alignment and tension.
    - h. Verify proper oil level in gear-drive housing. Fill with oil to proper level.
    - i. Operate variable-speed fans through entire operating range and check for harmonic vibration imbalance. Set motor controller to skip speeds resulting in abnormal vibration.
    - j. Check vibration switch setting. Verify operation.
    - k. Verify water level in tower basin. Fill to proper startup level. Check makeup water-level control and valve.
    - l. Verify operation of basin heater and control.
    - m. Verify that cooling tower air discharge is not recirculating air into tower or HVAC air intakes. Recommend corrective action.
    - n. Replace defective and malfunctioning units.
- D. Start cooling tower and associated water pumps. Follow manufacturer's written starting procedures.
- E. Prepare a written startup report that records the results of tests and inspections.

### 3.6 ADJUSTING

- A. Set and balance water flow to each tower inlet.
- B. Adjust water-level control for proper operating level.

### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain cooling towers.

END OF SECTION 236500  
08/19/2016

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Electrical equipment coordination and installation.
  - 2. Common electrical installation requirements.
  - 3. Coordination drawing requirements.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

- A. Product Data: For sleeve seals.

1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
  - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  - 3. To allow right of way for piping and conduit installed at required slope.
  - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordination drawings for electrical installation.
- C. Prepare coordination drawings according to Division 01 Section "Submittals" to a 1/4" = 1'-0" scale for floor plans. Detail major elements, components, and systems of electrical equipment and materials in relation to each other and to other systems, installations, and building components. Indicate locations and space requirements for installation, access, and working clearance. Show where sequence and coordination of installations are important to the efficient flow of the work. Coordinate drawing preparation with effort specified in other specification sections. Include the following:
  - 1. Provisions for scheduling, sequencing, moving and positioning large equipment in the building during construction.

2. Floor plans, elevations and details, including the following:
  - a. Clearances to meet safety requirements and for servicing and maintaining equipment, including space for equipment disassembly required for periodic maintenance.
  - b. Equipment support details.
  - c. Exterior wall, roof and foundation penetrations of cable and raceway; and their relation to other penetrations and installations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

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

END OF SECTION 260500

08/19/2016



## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

#### A. Section Includes:

- 1. Building wires and cables rated 600 V and less.
- 2. Connectors, splices, and terminations rated 600 V and less.

#### B. Related Requirements:

- 1. Section 260523 "Control-Voltage Electrical Power Cables" for control systems communications cables and Classes 1, 2 and 3 control cables.

### 1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.
- C. VFC: Variable frequency controller.

### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

### 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## PART 2 - PRODUCTS

### 2.1 GENERAL REQUIREMENTS

- A. Comply with requirements in Part 3 articles for where materials shall be applied.

## 2.2 CONDUCTORS AND CABLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products by one of the following:
  - 1. Alcan Products Corporation; Alcan Cable Division.
  - 2. Alpha Wire.
  - 3. Belden Inc.
  - 4. Encore Wire Corporation.
  - 5. General Cable Technologies Corporation.
  - 6. Southwire Incorporated.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2, Type XHHW-2.

## 2.3 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Gardner Bender.
  - 3. Hubbell Power Systems, Inc.
  - 4. Ideal Industries, Inc.
  - 5. Ilsco; a branch of Bardes Corporation.
  - 6. NSi Industries LLC.
  - 7. O-Z/Gedney; a brand of the EGS Electrical Group.
  - 8. 3M; Electrical Markets Division.
  - 9. Tyco Electronics.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## 2.4 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Branch Circuits: Type THHN-THWN-2, single conductors in raceway.
- B. Underslab Branch Circuits: Type XHHW-2, single conductors in raceway.
- C. Branch Circuits Connected to Generator, Power Systems: Type THHN-THWN in raceway independent from all other wiring and equipment.
- D. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- E. Class 2 Control Circuits: Type THHN-THWN, in raceway.
- F. Minimum Branch Circuit Conductor Size: No. 12 AWG. For all 120-volt circuits in excess of 100 ft. from power source to last device, provide No. 10 AWG entire length of circuit. For all 120-volt circuits in excess of 200 ft. from power source to last device, provide No. 8 AWG entire length of circuit. For all 208-volt circuits in excess of 200 ft. from power source to last device, provide No.10 AWG entire length of circuit. Wherever common neutrals are utilized, increase size of neutral one wire size over phase conductor size.
- G. VFC Output Circuits: Type XHHW-2 in metal conduit.
- H. Install dedicated neutral for every circuit.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values compound to be non-hardening type.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems" and Section 260548 "Vibration and Seismic Controls for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Perform the following tests and inspections:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test panelboards and equipment feeder conductors for compliance with requirements.
  - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
    - a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
    - b. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- C. Test and Inspection Reports: Prepare a written report to record the following:
  - 1. Procedures used.
  - 2. Results that comply with requirements.
  - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

08/19/2016

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 grounding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install stranded conductors for No. 12 AWG and larger unless otherwise indicated.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
  - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Report measured ground resistances that exceed the following values:
  - 1. Power and Lighting Equipment: 10 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526  
08/19/2016

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. This Section includes the following:
  - 1. Hangers and supports for electrical equipment and systems.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  - 1. Trapeze hangers. Include Product Data for components.
  - 2. Steel slotted channel systems. Include Product Data for components.
  - 3. Equipment supports.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit.
    - b. Cooper B-Line, Inc.
    - c. ERICO International Corporation.
    - d. GS Metals Corp.
    - e. Thomas & Betts Corporation.
    - f. Unistrut; Atkore International.
    - g. Wesanco, Inc.
  - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 3. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - 4. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.



- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1) Hilti, Inc.
  - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
  - 3) MKT Fastening, LLC.
  - 4) Simpson Strong-Tie Co., Inc.
  
- 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
  - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1) Cooper B-Line, Inc.
    - 2) Empire Tool and Manufacturing Co., Inc.
    - 3) Hilti, Inc.
    - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
    - 5) MKT Fastening, LLC.
  
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  - 6. Toggle Bolts: All-steel springhead type.
  - 7. Hanger Rods: Threaded steel.

## 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
  
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
  
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
  
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps, single-bolt conduit clamps, or single-bolt conduit clamps using spring friction action for retention in support channel.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  1. To Wood: Fasten with lag screws or through bolts.
  2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69, or spring-tension clamps.
  7. To Light Steel: Sheet metal screws.
  8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount disconnect switches, control enclosures, pull and junction boxes, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 painting sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529  
08/19/2016

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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:
  - 1. Metal conduits, tubing, and fittings.
  - 2. Boxes.

1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
  - 1. Structural members in paths of conduit groups with common supports.
  - 2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Source quality-control reports.

1.6 COORDINATION

- A. Coordinate layout and installation of raceways, boxes, and suspension system with other construction that penetrates ceilings or is supported by them, including luminaires, HVAC equipment, fire suppression system, and partition assemblies.

## PART 2 - PRODUCTS

### 2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
  2. Allied Tube & Conduit.
  3. Electri-Flex Company.
  4. O-Z/Gedney.
  5. Picoma Industries.
  6. Republic Conduit.
  7. Robroy Industries.
  8. Southwire Company.
  9. Thomas & Betts Corporation.
  10. Western Tube and Conduit Corporation.
  11. Wheatland Tube Company.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. EMT: Comply with ANSI C80.3 and UL 797.
- D. FMC: Comply with UL 1; zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Fittings for EMT:
    - a. Material: Steel.
    - b. Type: Setscrew or compression.
- G. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

### 2.2 BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Technologies Company; Cooper Crouse-Hinds.
  2. EGS/Appleton Electric.
  3. FSR Inc.
  4. Hoffman.
  5. Hubbell Incorporated.
  6. Milbank Manufacturing Co.
  7. Mono-Systems, Inc.

8. O-Z/Gedney.
  9. RACO; Hubbell.
  10. Spring City Electrical Manufacturing Company.
  11. Thomas & Betts Corporation.
  12. Wiremold / Legrand.
- B. General Requirements for Boxes: Boxes installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- F. Gangable boxes are prohibited.

### PART 3 - EXECUTION

#### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Concealed Conduit, Aboveground: GRC.
  2. Connection to Vibrating Equipment (Including Cooling Tower Motors, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  3. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. EMT: Comply with NEMA FB 2.10.
    - a. Utilize steel compression fittings in the following locations:
      - 1) Damp locations.
      - 2) Within block walls.
    - b. Utilize steel set-screw fittings in the following locations:
      - 1) Dry locations.

3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on Drawings.

### 3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Install conduits parallel or perpendicular to building lines.

F. Support raceway within 12 inches of enclosures to which attached.

G. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

H. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.

I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

J. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

K. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

L. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

M. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.



- O. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for motors.
  - 1. Use LFMC in damp or wet locations not subject to severe physical damage.
- P. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated. Switch height to be 48" AFF.
- Q. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- R. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- S. Locate boxes so that cover or plate will not span different building finishes.
- T. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

### 3.3 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

### 3.4 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 260533  
08/19/2016

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## PART 1 - GENERAL

### 1.1 INTENT

- A. It is the intent of this Specification to provide the basis of design for the vibration isolation, accommodation of differential seismic motion across building expansion/seismic joints, and seismic restraints on all systems specified under Division 26. The term "SYSTEMS" applies to all equipment and raceways on the project. The following Specification provides a requirement for the attachment of all non-structural components to the structure.

### 1.2 RELATED DOCUMENTS

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

### 1.3 SUMMARY

- A. This Section includes the following:
  - 1. Channel support systems.
  - 2. Anchorage bushings and washers.
  - 3. Building expansion/seismic joint accommodation equipment.
- B. Related Sections include the following:
  - 1. Section 260529 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

### 1.4 DEFINITIONS

- A. The IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.

### 1.5 PERFORMANCE REQUIREMENTS

- A. Comply with seismic restraint requirements in accordance with state and local codes and ordinances and the authority having jurisdiction.
- B. Determine the following, but not limited to, design criteria conditions for the project location required in accordance with all state and local codes and ordinances. Include criteria with code references in shop drawing submittal.
- C. Seismic-Restraint Loading:
  - 1. Site Class as Defined in the IBC: D.
  - 2. Assigned Building Classification Category as Defined in the IBC: IV.

- a. Component Importance Factor: 1.5 for life safety systems, components with hazardous content and components required for continued operation in Seismic Use Group III structures; 1.0 for all other components.
  - b. Component Response Modification Factor: As determined by the Seismic Engineer.
  - c. Component Amplification Factor: As determined by the Seismic Engineer.
3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 25.4 percent.
  4. Design Spectral Response Acceleration at 1.0-Second Period: 9.9 percent.
  5. Seismic Design Category: C; Electrical components with Importance Factor ( $I_p$ ) = 1.5 require seismic bracing. Components with  $I_p = 1.0$  are exempt from requirements for seismic bracing.
    - a. Owner's Project Requirements: All equipment to have an importance factor of 1.5 and to be seismically restrained per this Section.

#### 1.6 ACTION SUBMITTALS

- A. Product Data: For the following:
  1. Include detailed type, style, materials, rated load, rated deflection, and overload capacity for each vibration isolation device.
- B. Delegated-Design Submittal: For vibration isolation details indicated to comply with performance requirements and design criteria, including analysis data.
  1. Seismic Code Summary: Written summary of applicable codes, references, and criteria specific to the project.
  2. List of all electrical equipment and systems with annotation of where seismic anchoring and bracing is applicable. If a particular component is exempt due to the conditions of the project, it shall be so stated.
  3. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, forces required to select vibration isolators and expansion/seismic joint accommodation.
    - a. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other electrical Sections for equipment mounted outdoors.
  4. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
  5. Field-fabricated supports.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
  1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculations.

- a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
  - b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
- 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" article.
- 1. Professional Engineer: Professional liability.
  - 2. Manufacturer: Product liability.
- D. Field quality-control test reports.
- 1.8 QUALITY ASSURANCE
- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - B. Comply with NFPA 70.
- 1.9 COORDINATION
- A. Coordinate design of vibration isolation design with expansion compensation systems.
  - B. Coordinate and design all attachments with building structural system.
  - C. Coordinate and design all duct and pipe accommodations for building expansion/seismic joint crossovers.

## PART 2 - PRODUCTS

### 2.1 SEISMIC-RESTRAINT DEVICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
  - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
  - 2. Hilti Inc.
  - 3. Kinetics Noise Control.
  - 4. Mason Industries.
  - 5. Unistrut; Tyco International, Ltd.
  - 6. Vibration Mountings & Controls, Inc.

- B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction.
  - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- D. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or reinforcing steel angle clamped to hanger rod. Do not weld stiffeners to rods.
- F. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.
- G. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- H. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

## 2.2 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
  - 1. Powder coating on springs and housings.
  - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
  - 3. Baked enamel or powder coat for metal components on isolators for interior use.
  - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and equipment to receive building expansion/seismic joint accommodation for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction.

#### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
  - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
  - 2. Schedule test with Owner, through Engineer, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
  - 3. Obtain Engineer's approval before transmitting test loads to structure. Provide temporary load-spreading members.
  - 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
  - 5. Test to 90 percent of rated proof load of device.
  - 6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.

#### 3.4 ADJUSTING

- A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 260548

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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:
  - 1. Identification for raceways.
  - 2. Identification of power and control cables.
  - 3. Identification for conductors.
  - 4. Warning labels and signs.
  - 5. Instruction signs.
  - 6. Equipment identification labels.
  - 7. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

## PART 2 - PRODUCTS

### 2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage and system or service type.
- C. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

### 2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

### 2.3 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Snap-Around Labels: Slit, pre-tensioned, flexible, pre-printed, color-coded acrylic sleeve, with diameter sized to suit diameter of conductor it identifies and to stay in place by gripping action.
- C. Heat-Shrink Pre-printed Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around conductor it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.
- D. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

### 2.4 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.

- B. Self-Adhesive Warning Labels: Factory-printed, multi-color, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Warning label and sign shall include, but are not limited to, the following legends:
  - 1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

## 2.5 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
  - 1. Engraved legend with black letters on white face.
  - 2. Punched or drilled for mechanical fasteners.
  - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

## 2.6 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 2 inches.

## 2.7 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black except where used for color-coding.

## 2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape with adhesive appropriate to the location and substrate.
- G. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- I. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
  - 1. Outdoors: UV-stabilized nylon.
- J. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

### 3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways, 600 V or Less, for Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
  - 1. Power.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
  - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
  - b. Colors for 208/110-V Circuits:
    - 1) Phase A: Black.
    - 2) Phase B: Red.
    - 3) Phase C: Blue.
  - c. Colors for 480/277-V Circuits:
    - 1) Phase A: Brown.
    - 2) Phase B: Orange.
    - 3) Phase C: Yellow.
  - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes use write-on tags, self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- F. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive vinyl labels with the conductor designation.
- G. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
  2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
  1. Comply with 29 CFR 1910.145.
  2. Identify system voltage with black letters on an orange background.
  3. Apply to exterior of door, cover, or other access.

- I. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
  
- J. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
  - 1. Labeling Instructions:
    - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Stenciled legend 4 inches high.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
  
  - 2. Equipment to Be Labeled:
    - a. Panelboards: Updated, typewritten directory of circuits in the location provided by panelboard manufacturer.
    - b. Enclosures and electrical cabinets.
    - c. Equipment system boxes and enclosures.
    - d. Enclosed switches.
    - e. Enclosed controllers.
    - f. Variable-speed controllers.

END OF SECTION 260553  
08/19/2016

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section Includes:

- 1. Cartridge fuses rated 600-V ac and less for use in control circuits, controllers, VFCs.

### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components. Include the following for each fuse type indicated:

- 1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
  - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
  - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
- 2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
- 3. Current-limitation curves for fuses with current-limiting characteristics.
- 4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
- 5. Coordination charts and tables and related data.

### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

- 1. Ambient temperature adjustment information.
- 2. Current-limitation curves for fuses with current-limiting characteristics.
- 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
- 4. Coordination charts and tables and related data.

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Fuses: Equal to 20 percent of quantity installed for each size and type, but no fewer than six of each size and type.

## 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.

## 1.7 PROJECT CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

## 1.8 COORDINATION

- A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Cooper Bussmann, Inc. (low peak type) or comparable product by one of the following:
  - 1. Edison Fuse, Inc.
  - 2. Littlefuse, Inc.

### 2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, non-renewable cartridge fuses with voltage ratings consistent with circuit voltages.



**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 FUSE APPLICATIONS**

- A. Cartridge Fuses:
  - 1. Motor Branch Circuits: Class RK1, time delay.
  - 2. Other Branch Circuits: Class RK5, time delay.
  - 3. Control Circuits: Class CC, time delay.

**3.3 INSTALLATION**

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

**3.4 IDENTIFICATION**

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

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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.
- B. Section 019100 "General Commissioning Requirements."

1.2 SUMMARY

- A. Section includes separately enclosed, preassembled, combination VFCs, rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors.

1.3 DEFINITIONS

- A. BAS: Building automation system.
- B. CPT: Control power transformer.
- C. EMI: Electromagnetic interference.
- D. LED: Light-emitting diode.
- E. NC: Normally closed.
- F. NO: Normally open.
- G. OCPD: Overcurrent protective device.
- H. PID: Control action, proportional plus integral plus derivative.
- I. RFI: Radio-frequency interference.
- J. VFC: Variable-frequency motor controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and rating of VFC indicated.
  - 1. Include dimensions and finishes for VFCs.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For each VFC indicated.
  - 1. Include mounting and attachment details.

2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans, drawn to scale, showing dimensioned layout on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  1. Required working clearances and required area above and around VFCs.
  2. Show VFC layout and relationships between electrical components and adjacent structural and mechanical elements.
  3. Show support locations, type of support, and weight on each support.
  4. Indicate field measurements.
- B. Qualification Data: For testing agency.
- C. Seismic Qualification Certificates: For each VFC, accessories, and components, from manufacturer.
  1. Certificate of compliance.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based, and their installation requirements.
- D. Product Certificates: For each VFC from manufacturer.
- E. Source quality-control reports.
- F. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For VFCs to include in emergency, operation, and maintenance manuals.
  1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
    - a. Manufacturer's written instructions for testing and adjusting thermal-magnetic circuit breaker and motor-circuit protector trip settings.
    - b. Manufacturer's written instructions for setting field-adjustable overload relays.
    - c. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules.
    - d. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace VFCs that fail in materials or workmanship within specified warranty period. Warranty to include parts, labor and travel time.
  - 1. Warranty Period: Two years from date of start-up, not-to-exceed 30 months from date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. ABB.
  - 2. Danfoss Inc.
  - 3. Schneider Electric USA, Inc.
  - 4. Yaskawa Electric America, Inc.

2.2 SYSTEM DESCRIPTION

- A. General Requirements for VFCs:
  - 1. VFCs and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  - 2. Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508C.
- B. Application: Constant torque or variable torque depending on application.
- C. VFC Description: Variable-frequency motor controller, consisting of power converter that employs pulse-width-modulated inverter, factory built and tested in an enclosure, with integral disconnecting means and overcurrent and overload protection; listed and labeled by an NRTL as a complete unit; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency.
  - 1. Units suitable for operation of NEMA MG 1, Design A and Design B motors, as defined by NEMA MG 1, Section IV, Part 30, "Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Adjustable-Voltage or Adjustable-Frequency Controls or Both."
  - 2. Units suitable for operation of inverter-duty motors as defined by NEMA MG 1, Section IV, Part 31, "Definite-Purpose Inverter-Fed Polyphase Motors."

3. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.
- D. Design and Rating: Match load type, such as fans and blowers; and type of connection used between motor and load such as direct or through a power-transmission connection.
- E. Output Rating: Three phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.
- F. Unit Operating Requirements:
1. Input AC Voltage Tolerance: Plus 10 and minus 15 percent of VFC input voltage rating.
  2. Input AC Voltage Unbalance: Not exceeding 5 percent.
  3. Input Frequency Tolerance: Plus or minus 3 percent of VFC frequency rating.
  4. Minimum Efficiency: 97 percent at 60 Hz, full load.
  5. Minimum Displacement Primary-Side Power Factor: 98 percent under any load or speed condition.
  6. Minimum Short-Circuit Current (Withstand) Rating: 22 kAIC.
  7. Ambient Temperature Rating: Not less than 32 deg F and not exceeding 104 deg F.
  8. Humidity Rating: Less than 95 percent (noncondensing).
  9. Altitude Rating: Not exceeding 3300 feet.
  10. Vibration Withstand: Comply with NEMA ICS 61800-2.
  11. Overload Capability: 1.5 times the base load current for 60 seconds; minimum of 1.8 times the base load current for three seconds.
  12. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
  13. Speed Regulation: Plus or minus 5 percent.
  14. Output Carrier Frequency: Selectable; 0.5 to 8 kHz to minimize harmonically induced noise or vibration.
  15. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.
- G. Inverter Logic: Microprocessor based, 32 bit, isolated from all power circuits.
- H. Isolated Control Interface: Allows VFCs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.
- I. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 25 percent of maximum rpm.
  2. Maximum Speed: 80 to 100 percent of maximum rpm.
  3. Acceleration: 0.1 to 1800 seconds.
  4. Deceleration: 0.1 to 1800 seconds.
  5. Current Limit: 30 to minimum of 150 percent of maximum rating.
- J. Self-Protection and Reliability Features:
1. Surge Suppression: Factory installed as an integral part of the VFC, complying with UL 1449 SPD, Type 1 or Type 2.
  2. Surge Suppression: Field-mounted surge suppressors complying with Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits," UL 1449 SPD, Type 2.

3. Loss of Input Signal Protection: Selectable response strategy, including speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
  4. Under- and overvoltage trips.
  5. Inverter overcurrent trips.
  6. VFC and Motor-Overload/Overtemperature Protection: Microprocessor-based thermal protection system for monitoring VFCs and motor thermal characteristics, and for providing VFC overtemperature and motor-overload alarm and trip; settings selectable via the keypad.
  7. Critical frequency rejection, with three selectable, adjustable deadbands.
  8. Instantaneous line-to-line and line-to-ground overcurrent trips.
  9. Loss-of-phase protection.
  10. Reverse-phase protection.
  11. Short-circuit protection.
  12. Motor-overtemperature fault.
- K. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.
- L. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped, unless "Bidirectional Autospeed Search" feature is available and engaged.
- M. Bidirectional Autospeed Search: Capable of starting VFC into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.
- N. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.
- O. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.
- P. Integral Input Disconnecting Means and OCPD: Fusible disconnecting circuit device with pad-lockable, door-mounted handle mechanism.
1. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFC input current rating, whichever is larger.

## 2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: VFCs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. The designated VFCs shall be tested and certified by an NRTL as meeting the ICC-ES AC 156 test procedure requirements.
1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

## 2.4 CONTROLS AND INDICATION

- A. Status Lights: Door-mounted LED indicators displaying the following conditions:
1. Power on.
  2. Run.
  3. Overvoltage.
  4. Line fault.
  5. Overcurrent.
  6. External fault.
- B. Panel-Mounted Operator Station: Manufacturer's standard front-accessible, sealed keypad and plain-English-language digital display; allows complete programming, program copying, operating, monitoring, and diagnostic capability.
1. Keypad: In addition to required programming and control keys, include keys for HAND, OFF, and AUTO modes.
  2. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: View only; view and operate; and view, operate, and service.
    - a. Control Authority: Supports at least four conditions: Off, local manual control at VFC, local automatic control at VFC, and automatic control through a remote source.
- C. Historical Logging Information and Displays:
1. Real-time clock with current time and date.
  2. Running log of total power versus time.
  3. Total run time.
  4. Fault log, maintaining last three faults with time and date stamp for each.
- D. Indicating Devices: Digital display and additional readout devices as required, mounted flush in VFC door and connected to display VFC parameters including, but not limited to:
1. Output frequency (Hz).
  2. Motor speed (rpm).
  3. Motor status (running, stop, fault).
  4. Motor current (amperes).
  5. Motor torque (percent).
  6. Fault or alarming status (code).
  7. PID feedback signal (percent).
  8. DC-link voltage (V dc).
  9. Set point frequency (Hz).
  10. Motor output voltage (V ac).
  11. kW.
  12. KWH.
  13. Operating hours.



- E. Control Signal Interfaces:
1. Electric Input Signal Interface:
    - a. A minimum of two programmable analog inputs: 0- to 10-V dc or 4- to 20-mA dc.
    - b. A minimum of six multifunction programmable digital inputs.
  2. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the BAS or other control systems:
    - a. 0- to 10-V dc.
    - b. 4- to 20-mA dc.
    - c. Potentiometer using up/down digital inputs.
    - d. Fixed frequencies using digital inputs.
  3. Output Signal Interface: A minimum of two programmable analog output signals (0- to 10-V dc or 4- to 20-mA dc), which can be configured for any of the following:
    - a. Output frequency (Hz).
    - b. Output current (load).
    - c. DC-link voltage (V dc).
    - d. Motor torque (percent).
    - e. Motor speed (rpm).
    - f. Set point frequency (Hz).
  4. Remote Indication Interface: A minimum of three programmable dry-circuit relay outputs (120-V ac, 1 A) for remote indication of the following:
    - a. Motor running.
    - b. Set point speed reached.
    - c. Fault and warning indication (overtemperature or overcurrent).
    - d. PID high- or low-speed limits reached.
    - e. Motor current supervision.
- F. PID Control Interface: Provides closed-loop set point, differential feedback control in response to dual feedback signals. Allows for closed-loop control of fans and pumps for pressure, flow, or temperature regulation.
1. Number of Loops: Two.
- G. BAS Interface: Factory-installed hardware and software shall interface with BAS to monitor, control, display, and record data for use in processing reports. VFC settings shall be retained within VFC's nonvolatile memory.
1. Hardwired Points:
    - a. Monitoring: On-off status.
    - b. Control: On-off operation.
  2. Communication Interface: Comply with ASHRAE 135. Communication shall interface with BAS to remotely control and monitor lighting from a BAS operator workstation.

Control features and monitoring points displayed locally at lighting panel shall be available through the BAS.

3. Serial Communications:
  - a. The VFC shall have a RS-485 port as standard. The standard protocols shall be Modbus, BACnet, Johnson Controls N2 bus, and Siemens Building Technologies FLN. Each individual drive shall have the protocol in the base VFC. The use of third party gateways and multiplexers is not acceptable. All protocols shall be "certified" by the governing authority (i.e., BTL listing for BACnet). Use of non-certified protocols is not allowed.
4. The BACnet connection shall be a RS-485, MS/TP interface operating at 9.6, 19.2, 38.4 or 76.8 Kbps. The connection shall be tested by the BACnet Testing Labs (BTL) and be BTL listed. The BACnet interface shall conform to the BACnet standard device type of an Applications Specific Controller (B-ASC). The interface shall support all BIBBs defined by the BACnet standard profile for a B-ASC, including but not limited to:
  - a. Data Sharing – Read Property – B.
  - b. Data Sharing – Write Property – B.
  - c. Service Management – Dynamic Device Binding (Who-Is; I-Am).
  - d. Device Management – Dynamic Object Building (Who-Has; I-Have).
  - e. Device Management – Communication Control – B.
5. Serial communication capabilities shall include, but not be limited to, run-stop control, speed set adjustment, proportional/integral/derivative PID control adjustments, current limit, accel/decel time adjustments, and lock and unlock the keypad. The drive shall have the capability of allowing the DDC to monitor feedback such as process variable feedback, output speed/frequency, current (in amps), percent torque, power (kW), kilowatt hours (resettable), operating hours (resettable), and drive temperature. The DDC shall also be capable of monitoring the VFC relay output status, digital input status, and all analog input and analog output values. All diagnostic warning and fault information shall be transmitted over the serial communications bus. Remote VFC fault reset shall be possible.

## 2.5 LINE CONDITIONING AND FILTERING

- A. Input Line Conditioning: The VFC shall have 5 percent equivalent impedance internal reactors for all ratings to reduce the harmonics to the power line and to add protection from AC line transients. The 5 percent equivalent impedance may be from dual (positive or negative DC bus) reactors, or 5 percent AC line reactors. VFCs with only one DC reactor shall add an AC line reactor. Based on the manufacturer's harmonic analysis study and report, provide input filtering, as required, to limit total demand (harmonic current) distortion and total harmonic voltage demand at the defined point of common coupling to meet IEEE 519 recommendations.
- B. EMI/RFI Filtering: CE marked; certify compliance with IEC 61800-3 for Category C2.

## 2.6 OPTIONAL FEATURES

- A. Damper control circuit with end-of-travel feedback capability.

- B. Sleep Function: Senses a minimal deviation of a feedback signal and stops the motor. On an increase in speed-command signal deviation, VFC resumes normal operation.
- C. Motor Preheat Function: Preheats motor when idle to prevent moisture accumulation in the motor.
- D. Remote Indicating Circuit Terminals: Mode selection, controller status, and controller fault.
- E. Remote digital operator kit.
- F. Communication Port: RS-232 port, USB 2.0 port, or equivalent connection capable of connecting a printer and a notebook computer.

## 2.7 ENCLOSURES

- A. VFC Enclosures: NEMA 250, to comply with environmental conditions at installed location outdoors on roof.

## 2.8 ACCESSORIES

- A. General Requirements for Control-Circuit and Pilot Devices: NEMA ICS 5; factory installed in VFC enclosure cover unless otherwise indicated.
- B. Reversible NC/NO bypass contactor auxiliary contact(s).
- C. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- D. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.
  - 1. Current Transformers: Continuous current rating, basic impulse insulating level (BIL) rating, burden, and accuracy class suitable for connected circuitry. Comply with IEEE C57.13.
- E. Spare control-wiring terminal blocks; wired.

## 2.9 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect VFCs according to requirements in NEMA ICS 61800-2.
  - 1. Test each VFC while connected to a motor that is comparable to that for which the VFC is rated.
  - 2. Verification of Performance: Rate VFCs according to operation of functions and features specified.
- B. VFCs will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas, surfaces, and substrates to receive VFCs, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.
- B. Examine VFC before installation. Reject VFCs that are wet, moisture damaged, or mold damaged.
- C. Examine roughing-in for conduit systems to verify actual locations of conduit connections before VFC installation.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Back-Mounting Controllers: Install with tops at uniform height and with disconnect operating handles not higher than 79 inches above roof walking surface, unless otherwise indicated, and by bolting units on freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems."
- B. Seismic Bracing: Comply with requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- D. Comply with NECA 1.

#### 3.3 CONTROL WIRING INSTALLATION

- A. Install wiring between VFCs and remote devices and facility's central-control system. Comply with requirements in Section 260523 "Control-Voltage Electrical Power Cables."
- B. Install control wiring per Section 230900 "Instrumentation and Control for HVAC."
- C. Bundle, train, and support wiring in enclosures.
- D. Connect selector switches and other automatic-control devices where applicable.
  - 1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switches are in manual-control position.
  - 2. Connect selector switches with control circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor-overload protectors.

### 3.4 IDENTIFICATION

- A. Identify VFCs, components, and control wiring. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
  - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
  - 2. Label each VFC with engraved nameplate.
  - 3. Label each enclosure-mounted control and pilot device.
- B. Operating Instructions: Frame printed operating instructions for VFCs, including control sequences and emergency procedures. Fabricate frame of finished metal, and cover instructions with clear acrylic plastic. Mount on front of VFC units.

### 3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each VFC element, bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- C. Tests and Inspections:
  - 1. Inspect VFC, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
  - 2. Test insulation resistance for each VFC element, component, connecting motor supply, feeder, and control circuits.
  - 3. Test continuity of each circuit.
  - 4. Verify that voltages at VFC locations are within 5 percent of motor nameplate rated voltages. If outside this range for any motor, notify Engineer before starting the motor(s).
  - 5. Test each motor for proper phase rotation.
  - 6. Perform tests according to the Inspection and Test Procedures for Adjustable Speed Drives stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. VFCs will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies the VFC and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.

3.6 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service on the VFCs serving the cooling tower fans.
  - 1. Complete installation and startup checks according to manufacturer's written instructions.

3.7 ADJUSTING

- A. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.
- B. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- C. Adjust the trip settings of instantaneous-only circuit breakers and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to 6 times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed 8 times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Architect, Construction Manager and Owner before increasing settings.
- D. Set field-adjustable pressure switches.

3.8 PROTECTION

- A. Replace VFCs whose interiors have been exposed to water or other liquids prior to Substantial Completion.

3.9 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, reprogram, and maintain VFCs.

END OF SECTION 262923

01/09/2017

# Statement of Special Inspections

Project: *Cooling Tower Replacement*

Location: *1111 Country Club Road, Middletown CT 06457*

Owner: *State of Connecticut*

Design Professional in Responsible Charge:

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Special Inspection Coordinator and the identity of other approved agencies to be retained for conducting these inspections and tests. This *Statement of Special Inspections* encompass the following disciplines:

- Structural       Mechanical/Electrical/Plumbing  
 Architectural       Other: \_\_\_\_\_

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Interim Report Frequency: *Monthly* or  per attached schedule.

Prepared by:

*Karl F Frey, PE*  
(type or print name)

*Karl F Frey*      *9-27-2016*  
Signature      Date



Owner's Authorization:

Building Official's Acceptance:

\_\_\_\_\_  
Signature      Date

\_\_\_\_\_  
Signature      Date

# Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- |  |  |
|--|--|
| <input type="checkbox"/> Soils and Foundations       | <input type="checkbox"/> Spray Fire Resistant Material             |
| <input type="checkbox"/> Cast-in-Place Concrete      | <input type="checkbox"/> Wood Construction                         |
| <input type="checkbox"/> Precast Concrete            | <input type="checkbox"/> Exterior Insulation and Finish System     |
| <input type="checkbox"/> Masonry                     | <input type="checkbox"/> Mechanical & Electrical Systems           |
| <input checked="" type="checkbox"/> Structural Steel | <input type="checkbox"/> Architectural Systems                     |
| <input type="checkbox"/> Cold-Formed Steel Framing   | <input type="checkbox"/> Small Diameter Grouted Piles (Micropiles) |

Special Inspection Agencies	Firm	Address, Telephone, e-mail
1. Special Inspection and Testing Agency	To be determined	
2.		
3.		
4.		
5.		
6.		

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.



## Quality Assurance Plan

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### Quality Assurance for Seismic Resistance

Seismic Design Category	<i>C</i>
Quality Assurance Plan Required (Y/N)	<i>N</i>

### Quality Assurance for Wind Requirements

Basic Wind Speed (3 second gust)	<i>105</i>
Wind Exposure Category	<i>C</i>
Quality Assurance Plan Required (Y/N)	<i>N</i>

Description of wind force resisting system and designated wind resisting components:

### Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

# Qualifications of Inspectors and Testing Technicians

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The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

## Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

### American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

### American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

### American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.
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### International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

### National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

### Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector
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### Other

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<b>Structural Steel</b>		
<b>Item</b>	<b>Agency # (Qualif.)</b>	<b>Scope</b>
1. Fabricator Certification / Quality Control Procedures	1 AWS/ AISC-SSI ICC-SWSI	Verify that structural steel fabricator is AISC certified.
2. Material Certification	1 AWS/ AISC-SSI ICC-SWSI	Certified mill test reports for structural steel, bolts, nuts, washers, and welding electrodes shall be reviewed by the Special Inspector. Verify grade of steel. Material identification markings shall be reviewed for compliance by on site Testing Technician.
3. Bolting	1 AWS/ AISC-SSI ICC-SWSI	Inspect installation and tightening of high-strength bolts. Verify that splines have separated from tension control bolts. Verify proper tightening sequence. Continuous inspection of bolts in slip-critical connections. Visually inspect 100% of all field installed high-strength bolts for proper installation and connection fit-up.
4. Welding	1 AWS-CWI ASNT	Check welder qualifications. Visually inspect all welds. Inspect pre-heat, post-heat and surface preparation between passes. Verify size and length of fillet welds. Shop and field inspection is required. The Special Inspector shall witness the welding of all complete and partial penetration groove welds, multipass fillet welds, and single-pass fillet welds greater than 5/16 inch.  Ultrasonic testing of all full-penetration welds. All full-penetration welds to be inspected by ASNT Level II qualified inspection agent.
5. Structural Details	1 AWS/ AISC-SSI	Inspect steel frame for compliance with structural drawings and approved shop drawings, including bracing, member configuration, size, camber, and connection details.
6. Field Correction of Fabricated Items	1 AWS/ AISC-SSI	Review documentation of RDP approved repair and verify completion of repairs.
7. Other Reports	1 PE	Review contractor's field quality control procedures. Monitor testing lab and field inspection results to ensure conformance with construction documents. Notify Engineer of Record immediately of all discrepancies.

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