

TOWN OF CHESHIRE, CONNECTICUT

**REQUEST
FOR PROPOSALS**

Cheshire High School
HVAC IMPROVEMENTS

BID #2223-10

LEGAL NOTICE

TOWN OF CHESHIRE, CONNECTICUT

REQUEST FOR PROPOSALS

RFP # 2223-10

HVAC Improvements at Cheshire High School
November 4, 2022

The Town of Cheshire is seeking competitive proposals for ***HVAC Improvements at Cheshire High School***. Sealed proposals are due by **2:00 pm, on November 21, 2022** at the office of the Department of Public Works, Cheshire Town Hall, 84 South Main Street, Cheshire, Connecticut 06410. At that time, proposals will be opened in public and read aloud.

The documents comprising the Request for Proposals (“RFP Documents”) may be obtained on the Town's website, www.cheshirect.org, under "Businesses" / “Bids & RFP's – doing business with the Town.”

The Town of Cheshire reserves the rights to amend or terminate this Request for Proposals, accept all or any part of a proposal, reject all proposals, waive any informalities or non-material deficiencies in a proposal, and award the proposal to the proposer that, in the Town's sole discretion and judgment, will be in the Town's best interests.

TOWN OF CHESHIRE, CONNECTICUT

REQUEST FOR PROPOSALS FOR
CHESHIRE HIGH SCHOOL HVAC IMPROVEMENTS

Proposal Number: 2223-10

Proposal Opening Date: 11-21-2022

Proposal Opening Time: 2:00 pm

Proposal Opening Place: Cheshire Town Hall, Room 207

The Town of Cheshire is seeking proposals for the removal of old unit ventilators and provide rooftop air handling units to improve indoor air quality in the classrooms through ventilation heating and cooling and related construction.

One (1) original and 2 copies of sealed proposals accompanied by a digital copy on a removable thumb drive must be received in the Cheshire Town Hall, Department of Public Works and Engineering, Room 213, 84 South Main Street, Cheshire, CT 06410 by the date and time noted above. The Town of Cheshire (the "Town") will not accept submissions by e-mail or fax. The Town will reject proposals received after the date and time noted above.

The documents comprising this Request for Proposals may be obtained on the Town's website, www.cheshirect.org, under "Proposals & RFP's." **Each proposer is responsible for checking the Town's website to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the RFP as modified by the addenda.**

Proposals shall be held firm and cannot be withdrawn for sixty (60) calendar days after the opening date.

The Town reserves the rights to amend or terminate this Request for Proposals, accept all or any part of a proposal, reject all proposals, waive any informalities or non-material deficiencies in a proposal, and award the proposal to the proposer that, in the Town's sole discretion and judgment, will be in the Town's best interests.

This Request for Proposals ("RFP") includes:

- Standard Instructions to Proposers
- Specifications
- Insurance Requirements

- Proposal Form
- Proposer's Legal Status Disclosure
- Proposer's Certification Concerning Equal Employment Opportunities and Affirmative Action Policy
- Proposer's Non Collusion Affidavit
- Proposer's Statement of References
- Addenda, if any
- The Contract in the form attached

TOWN OF CHESHIRE, CONNECTICUT

STANDARD INSTRUCTIONS TO PROPOSERS

1. INTRODUCTION

The Town of Cheshire (the "Town") is soliciting proposals for *Cheshire High School HVAC Improvements*. This RFP is not a contract offer, and no contract will exist unless and until a written contract is signed by the Town and the successful proposer.

Interested parties should submit a proposal in accordance with the requirements and directions contained in this RFP. **Proposers are prohibited from contacting any Town employee, officer or official concerning this RFP, except as set forth in Section 6, below. A proposer's failure to comply with this requirement may result in disqualification.**

If there are any conflicts between the provisions or these Standard Instructions to Proposers and any other documents comprising this RFP, these Standard Instructions to Proposers shall prevail.

2. RIGHT TO AMEND OR TERMINATE THE RFP OR CONTRACT

The Town may, before or after proposal opening and in its sole discretion, clarify, modify, amend or terminate this RFP if the Town determines it is in the Town's best interest. Any such action shall be effected by a posting on the Town's website, www.cheshirect.org, under "Proposals & RFP's." **Each proposer is responsible for checking the Town's website to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the RFP as modified by the addenda.**

If this RFP provides for a multi-year agreement, the Town also reserves the right to terminate the Contract at the end of the last fiscal year for which funds have been appropriated, and the Town shall have no obligation or liability to the successful proposer for any unfunded year or years.

3. KEY DATES

Non-Mandatory Pre-Proposal Site Visit: **11-14-2022 @ 3:00 pm**

Proposal Opening: **11-21-2022 @ 2:00 pm**

Preliminary Notice of Award: **12-15-2022**

Contract Execution: **12-20-2022**

The Preliminary Notice of Award and Contract Execution dates are anticipated, not certain, dates. If awarded a contract, the successful respondent agrees, by the submission of its proposal, that it shall sign the contract provided by the Town without alteration or modification within five (5) days of receipt of notice of award.

4. OBTAINING THE RFP

All documents that are a part of this RFP may be obtained on the Town's website, www.chshirect.org, under "Proposals & RFP's."]

5. PROPOSAL SUBMISSION INSTRUCTIONS

Proposals must be received in the **Cheshire Town Hall, Department of Public Works and Engineering, Room 213, 84 South Main Street, Cheshire, CT 06410** prior to the date and time the proposals are scheduled to be opened publicly. Postmarks prior to the opening date and time do **NOT** satisfy this condition. The Town will not accept submissions by e-mail or fax. Proposers are solely responsible for ensuring timely delivery. The Town will **NOT** accept late proposals.

One (1) original and 2 copies of all proposal documents accompanied by a digital copy on a removable thumb drive must be submitted in sealed, opaque envelopes clearly labeled with the proposer's name, the proposer's address, the words "**PROPOSAL DOCUMENTS**," and the **Proposal Title, Proposal Number and Proposal Opening Date**. The Town may decline to accept proposals submitted in unmarked envelopes that the Town opens in its normal course of business. The Town may, but shall not be required to, return such proposal documents and inform the proposer that the proposal documents may be resubmitted in a sealed envelope properly marked as described above.

Proposal prices must be submitted on the Proposal Form included in this RFP. All blank spaces for proposal prices must be completed in ink or be typewritten; proposal prices must be stated in both words and figures. The person signing the Proposal Form must initial any errors, alterations or corrections on that form. Ditto marks (" ") or words such as "SAME" shall not be used in the Proposal Form.

Proposals may be withdrawn personally or in writing provided that the Town receives the withdrawal prior to the time and date the proposals are scheduled to be opened. Proposals are considered valid, and may not be withdrawn, cancelled, or modified, for sixty (60) days after opening. after the opening date, to give the Town sufficient time to review the proposals, investigate the proposers' qualifications, secure any required municipal approvals, and execute a binding contract with the successful proposer.

An authorized person representing the legal entity of the proposer must sign the Proposal Form and all other forms included in this RFP.

6. QUESTIONS AND AMENDMENTS

Respondents shall promptly notify the Town of any ambiguity, inconsistency or error which they may discover upon examination of the RFP and/or any documents provided or issued by the Town in conjunction with the RFP. Interpretations, corrections and changes made to the RFP Documents will be made by written addenda. Addenda are written instruments issued by the Town prior to the proposal opening date, which modify or interpret the RFP Documents by addition, deletion, clarification or correction.

Questions concerning the process and procedures applicable to this RFP are to be submitted **in writing** (including by e-mail or fax) and directed **only to:**

Name: Daniel Bombero
Department: Public Works
E-mail: dbombero@cheshirect.org
Fax: 203-271-6659

Questions concerning the RFP Documents are to be submitted **in writing** (including by e-mail or fax) and directed **only to:**

Name: Daniel Bombero
Department: Public Works
E-mail: dbombero@cheshirect.org
Fax: 203-271-6659

Proposers are prohibited from contacting any other Town employee, officer or official concerning this RFP. A proposer's failure to comply with this requirement may result in disqualification.

The appropriate Town representative listed above must receive any questions from proposers no later than seven (7) business days before the proposal opening date. That representative will confirm receipt of a proposer's questions by e-mail. The Town will answer all written questions by issuing one or more addenda, which shall be a part of this RFP and the resulting Contract, containing all questions received as provided for above and responses to same.

At least four (4) calendar days prior to proposal opening, the Town will post any addenda on the Town's website, www.cheshirect.org, under "Proposals & RFP's." **Each proposer is responsible for checking the website to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the RFP as modified by the addenda.**

No oral statement of the Town, including oral statements by the Town representatives listed above, shall be effective to waive, change or otherwise modify any of the provisions of this RFP, and no proposer shall rely on any alleged oral statement.

7. **ADDITIONAL INFORMATION/REQUIREMENTS**

- 7.1 **Delivery/Time for Performance.** TIME IS OF THE ESSENCE with regard to the performance of the services procured through this RFP and the Contract to be entered into by the Town with the selected proposer, if any. Strict compliance with and adherence to the schedule for the services and the Contract is mandatory. If, in the sole opinion of the Town, the selected proposer is not adhering to the contract schedule, upon forty-eight (48) hours written notice from the Town to the selected proposer, the Town shall have the right to direct the proposer to increase its manpower to meet the established project schedule (including any milestones) without additional compensation. Any and all such additional labor or supervision shall be at proposer's sole cost and expense and may include, but shall not be limited to, the Town directing the selected proposer to work overtime, work weekends, or any combination thereof, without any additional compensation being due to proposer for such additional personnel. In addition, the Town shall have the right but not the obligation to supplement the proposer's forces with that of another vendor in order to achieve compliance with the project schedule. All costs attributable to the supplemental labor and supervision of same shall be the sole obligation and responsibility of the selected proposer. Failure to strictly adhere to the schedule (including any milestones) and the provisions of this paragraph 7.1 shall constitute a material default of proposer's contractual obligations and entitle the Town, in its discretion, to all remedies for default set forth in the contract.

- 7.2 **Termination of Contract.** Contracts shall remain in force for the period within which the selected proposer must perform as set forth in the proposal, unless an extension has been agreed upon as evidenced by a contract extension executed in writing by both the selected proposer and the Town.
- 7.3 **Assignment.** Proposer shall not assign, transfer or subcontract this contract or its obligations hereunder without the prior written consent of the Town, which consent may be withheld in the Town's sole discretion.
- 7.4 **Default.** The contract may be terminated by the Town by written notice of default to the upon non-performance or breach of the contract terms. The awarded proposer shall be obligated to pay the Town for all losses, damages, costs and expenses, including the cost of re-procurement, and attorney's fees incurred defending claims arising from such default and in seeking recovery of all such costs and expenses from proposer and/or its surety. Upon a termination for cause, the Town shall have no further obligation to issue payments to the proposer until resolution of the dispute.
- 7.5 **Conflict.** To the extent any of the contract terms set forth herein conflict with the terms of the form Contract entered into by the parties, the Contract terms shall control.
- 7.6 **COVID-19:** Proposers shall anticipate and incorporate into their proposals all potential costs and delays related to a public health emergency such as the COVID-19 coronavirus pandemic, including the cost of compliance with rules, regulations, guidelines and recommendations issued by public authorities. Potential costs may include but are not limited to, costs related to inefficiency, lost productivity, delays of performance, social distancing, manpower levels, project scheduling, coordination, material/product supply chain delays and disruptions, delivery delays, material escalation, and any other potential costs. In no event shall the Town be liable for any such costs and/or delays.

The Town reserves the right, either before or after the opening of proposals, to ask any proposer to clarify its proposal or to submit any additional information that the Town in its sole discretion deems desirable.

8. COSTS FOR PREPARING PROPOSAL

Each proposer's costs incurred in developing its proposal are its sole responsibility, and the Town shall have no liability for such costs.

9. OWNERSHIP OF PROPOSALS

All proposals submitted become the Town's property and will not be returned to proposers.

10. FREEDOM OF INFORMATION ACT

All information submitted in a proposal or in response to a request for additional information is subject to disclosure under the Connecticut Freedom of Information Act as amended and judicially interpreted. A proposer's responses may contain financial, trade secret or other data that it claims should not be public (the "Confidential Information"). A proposer must identify specifically the pages and portions of its proposal or additional information that contain the claimed Confidential Information by visibly marking all such pages and portions. Provided that the proposer cooperates with the Town as described in this section, the Town shall, to the extent permitted by law, protect

from unauthorized disclosure such Confidential Information.

If the Town receives a request for a proposer's Confidential Information, it will promptly notify the proposer in writing of such request and provide the proposer with a copy of any written disclosure request. The proposer may provide written consent to the disclosure, or may object to the disclosure by notifying the Town in writing to withhold disclosure of the information, identifying in the notice the basis for its objection, including the statutory exemption(s) from disclosure. The proposer shall be responsible for defending any complaint brought in connection with the nondisclosure, including but not only appearing before the Freedom of Information Commission, and providing witnesses and documents as appropriate.

11. REQUIRED DISCLOSURES

In its Proposal Form each proposer must disclose, if applicable:

- Its inability or unwillingness to meet any requirement of this RFP, including but not only any of the Contract Terms referenced herein and in the contract template provided by the Town as part of this RFP (if applicable);
- If it is listed on the State of Connecticut's Debarment List;
- If it is ineligible, pursuant to Conn. Gen. Stat. § 31-57b, to be awarded the Contract because of occupational safety and health law violations;

- All resolved and pending arbitrations and litigation matters in which the proposer or any of its principals (regardless of place of employment) has been involved within the last ten (10) years;
- All criminal proceedings in which the proposer or any of its principals (regardless of place of employment) has ever been the subject; and
- Each instance in which it or any of its principals (regardless of place of employment) has ever been found to have violated any state or local ethics law, regulation, ordinance, code, policy or standard, or to have committed any other offense arising out of the submission of proposals or bids or the performance of work on public works projects or contracts.

A proposer's acceptability based on these disclosures lies solely in the Town's discretion.

12. REFERENCES

Each proposer must complete and submit the Proposer's Statement of References form included in this RFP.

13. LEGAL STATUS

If a proposer is a corporation, limited liability company, or other business entity that is required to register with the Connecticut Secretary of the State's Office, it must have a current registration on file with that office. The Town may, in its sole discretion, request acceptable evidence of any proposer's legal status.

14. PROPOSAL (BID) SECURITY

[Proposal (bid) security, whether in the form of a certified check or a proposal (bid) bond, guarantees the Town that, if the proposer is awarded the proposal, the proposer will deliver the insurance certificate, if required, the W-9 form and anything else required under the procurement, and will execute the contract at the proposal price. Security ensures the integrity of a proposal response. If the successful proposer refuses to enter into the contract, the security will be forfeited to the Town as liquidated damages not as a penalty.]

Each proposal must be accompanied by a certified check of the proposer or a proposal (bid) bond with a surety acceptable to the Town in an amount equal to at least **TEN PERCENT (10%)** of the proposal amount. The proposal (bid) bond shall be written by a company or companies licensed to issue bonds in the State of Connecticut, which company or companies shall have at least an "A-" VIII policyholders rating as reported in the latest edition of Best Publication's Key Rating Guide. The successful proposer, upon its refusal or failure to execute and deliver the Contract, certificate(s) of insurance, W-9 form, performance security or other documents required by this RFP within **five (5) business days** of written notification of preliminary award, unless the Town otherwise agrees in writing, shall forfeit to the Town, as liquidated damages for such failure or refusal, the security submitted with its proposal.

Upon the successful proposer's execution of the Contract in the form provided with this RFP, the Town shall return the proposal security to the successful proposer and to all other proposers.

15. PRESUMPTION OF PROPOSER'S FULL KNOWLEDGE

Each proposer is responsible for having read and understood each document in this RFP and any addenda issued by the Town. A proposer's failure to have reviewed all information that is part of or applicable to this RFP, including but not limited to any addenda posted on the Town's website, shall in no way relieve it from any aspect of its proposal or the obligations related thereto.

Each proposer is deemed to be familiar with and is required to comply with all federal, state and local laws, regulations, ordinances, codes and orders that in any manner relate to this RFP or the performance of the work described herein.

By submitting a proposal, each proposer represents that it has thoroughly examined and become familiar with the scope of work outlined in this RFP, and it is capable of performing the work to achieve the Town's objectives. If applicable, each proposer shall visit the site, examine the areas and thoroughly familiarize itself with all conditions of the property before preparing its proposal.

16. SUBSTITUTION FOR NAME BRANDS

The proposer must attach detailed information concerning deviations from any name brands specified in the RFP and explain in detail how the substitution compares with the name brand's specifications. The Town in its sole discretion shall decide whether the substitution is acceptable.

17. TAX EXEMPTIONS

The Town is exempt from the payment of federal excise taxes and Connecticut sales and use taxes. Federal Tax Exempt #066-001971. Exemption from State sales tax per Conn. Gen. Stat. Chapter 219, § 12-412(1). No exemption certificates are required, and none will be issued.

18. INSURANCE

Vendor shall maintain in force at all times during which services are to be performed by vendor, or such longer period as provided by contract, the following coverages placed with company(ies) licensed by the State of Connecticut which have at least an "A-" VIII policyholders rating according to A.M. Best's latest edition Key Rating Guide. The stated policy limits are the minimum coverage amounts required.

		(Minimum Limits)
General Liability*	Each Occurrence	\$1,000,000
	General Aggregate	\$2,000,000
	Products/Completed Operations Aggregate	\$2,000,000
Auto Liability*	Combined Single Limit	
	Each Accident	\$1,000,000
Umbrella* (Excess Liability)	Each Occurrence	\$1,000,000
	Aggregate	\$1,000,000

* The Town of Cheshire, and its Board of Education (if applicable) shall be named as "Additional Insured". Coverage is to be provided on a primary, noncontributory basis. Waiver of subrogation to be provided. Higher limits may be required, based on the scope and nature of the services to be provided. If higher limits are required, such limits shall be identified in the Request for Proposal of Invitation to Bid, as well as in the contract issued by the Town. The Town reserves the right to require additional coverages, including, without limitation, Builder's Risk insurance for construction projects and Owner's Protective Liability insurance, if desirable.

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Workers' Compensation and	WC Statutory Limits	
Employers' Liability	EL Each Accident	\$500,000
	EL Disease Each Employee	\$500,000
	EL Disease Policy Limit	\$500,000

Original, completed Certificates of Insurance must be presented to the Town's Purchasing Agent prior to purchase order issuance and contract execution. Vendor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration of the policy. Should any of the above described policies be cancelled before the expiration date, written notice must be provided to the Town 30 days prior to cancellation. Failure to maintain required insurance coverage shall be a material default of vendor's contract with the Town.

The successful proposer shall, at its own expense and cost, obtain and keep in force at least the insurance listed in the Insurance Requirements that are a part of this RFP. The Town reserves the right to require from the successful proposer a complete, certified copy of any required insurance policy.

19. PERFORMANCE SECURITY

The successful proposer shall furnish security a performance bond covering the faithful performance of the Contract (the "Performance Security"). The Performance Security shall be \$, and in a form reasonably acceptable to the Town. If the Performance Security is a performance bond, it shall be issued by a company licensed by the State of Connecticut that is a T List surety and has at least an "A-" VIII policyholders rating according to Best Publication's latest edition Key Rating Guide." The cost of the Performance Security shall be included in the proposal price.

In addition to the Performance Security, the successful proposer shall furnish a bond covering the successful proposer's payment to its subcontractors and suppliers of all obligations arising under the Contract (the "Payment Bond"). The Payment Bond shall be (a) in the full amount of the Contract price; (b) in a form reasonably acceptable to the Town; and (c) issued by a company licensed by the State of Connecticut that has at least an "A-" VIII policyholders rating according to Best Publication's latest edition Key Rating Guide and is on the T List. The cost of the Payment Bond shall be included in the proposal price.

20. DELIVERY ARRANGEMENTS

The successful proposer shall deliver the items that are the subject of the RFP, at its sole cost and expense, to the location(s) listed in the Specifications.

21. AWARD CRITERIA; SELECTION; CONTRACT EXECUTION

All proposals will be publicly opened and read aloud as received on the date, at the time, and at the place identified in this RFP. Proposers may be present at the opening, unless expressly prohibited by the Town.

The Town reserves the right to correct, after proposer verification, any mistake in a proposal that is a clerical error, such as a price extension, decimal point error or FOB terms. If an error exists in an extension of prices, the unit price shall prevail. In the event of a discrepancy between the price quoted in words and in figures, the words shall control.

The Town reserves the rights to accept all or any part of a proposal, reject all proposals, and waive any informalities or non-material deficiencies in a proposal. The Town also reserves the right, if applicable, to award the purchase of individual items under this RFP to any combination of separate proposals or proposers.

The Town will accept the proposal that, all things considered, the Town determines is in its best interests. Although price will be an important factor in most RFPs, it will not be the only basis for award. Due consideration may also be given to a proposer's experience, references, service, ability to respond promptly to requests, past performance, and other criteria relevant to the Town's interests, including compliance with the procedural requirements stated in this RFP.

The Town will not award the proposal to any business that or person who is in arrears or in default to the Town with regard to any tax, debt, charge, contract, security or any other obligation.

If the lowest proposer meets all specifications, is responsive, and, if applicable, qualified, but the proposal is not acceptable to the Town Manager or, if applicable, the Public Building Commission or the Board of Education, the matter must be referred to the Town Council for its decision on whether to reject all proposals, to accept a higher proposal, or to take such other action as may be in the Town's best interests.

The Town will select the proposal that it deems to be in the Town's best interest and issue a Preliminary Notice of Award to the successful proposer. The award may be subject to further discussions with the proposer. **The making of a preliminary award to a proposer does not provide the proposer with any rights and does not impose upon the Town any obligations. The Town is free to withdraw a preliminary award at any time and for any reason. A proposer has rights, and the Town has obligations, only if and when a Contract is fully executed by the Town and the proposer.**

If the proposer does not execute the Contract within five (5) business days of the date of the Preliminary Notice of Award, unless extended by the Town, the Town may call any proposal security provided by the proposer and may enter into discussions with another proposer.

The Preliminary Notice of Award and Contract Execution dates in Section 3's Key Dates are anticipated, not certain, dates.

22. AFFIRMATIVE ACTION, AND EQUAL OPPORTUNITY

Each proposer must submit a completed Proposer's Certification Concerning Equal Employment Opportunities and Affirmative Action Policy form included with this RFP. Proposers with fewer than ten (10) employees should indicate that fact on the form and return the form with their proposals

23. NONRESIDENT CONTRACTORS

If the successful proposer is a "nonresident contractor" as defined in Conn. Gen. Stat. § 12-430(7)(A) as amended, it shall comply fully with the provisions of § 12-430(7) and, prior to execution of the Contract, shall furnish the Town with a copy of the requisite certificate of compliance set forth in C.G.S. § 12-430(7)(E). The successful proposer agrees to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from any and all taxes, interest and penalties that the State of

Connecticut asserts are due with respect to the successful proposer's activities under the Contract.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this section, whether or not a lawsuit or other proceeding is commenced, which obligations shall survive the termination or expiration of the Contract.

24. COMPLIANCE WITH IMMIGRATION LAWS

By submitting a proposal, each proposer confirms that it has complied, and during the term of the Contract will comply, with the Immigration Reform and Control Act ("IRCA") and that each person it provides under the Contract will at all times be authorized for employment in the United States of America. Each proposer confirms that it has a properly completed Employment

Eligibility Verification, Form I-9, for each person who will be assigned under the Contract and that it will require each subcontractor, if any, to confirm that it has a properly completed Form I-9 for each person who will be assigned under the Contract.

The successful proposer shall defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), against any and all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including fines, penalties, punitive damages, attorney's fees and costs, brought or assessed against, or incurred by, the Town Indemnified Parties related to or arising from the obligations under IRCA imposed upon the successful proposer or its subcontractor. The successful proposer shall also be required to pay any and all attorney's fees and costs incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this provision, whether or not a lawsuit or other proceeding is commenced, which obligations shall survive the termination or expiration of the Contract.

25. NON COLLUSION AFFIDAVIT

Each proposer shall submit a completed Proposer's Non Collusion Affidavit that is part of this RFP.

26. CONTRACT TERMS

The following provisions will be among the mandatory terms of the Town's Contract with the successful proposer. If a proposer is unwilling or unable to meet any of these Contract Terms, the proposer must disclose that inability or unwillingness in its Proposal Form (see Section 11 of these StandardInstructions to Proposers):

a. DEFENSE HOLD HARMLESS AND INDEMNIFICATION

The successful proposer agrees, to the fullest extent permitted by law, to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers, boards, commissions, committees, and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from and against all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including attorney's fees, arising out of or relating, directly or indirectly, to the successful proposer's performance of the contract, including but not limited to proposer's malfeasance, misconduct, negligence or failure to meet its obligations under the RFP or the Contract. The successful proposer's obligations under this section shall not be limited in any way by any limitation on the amount or type of the successful proposer's insurance. Nothing in this section shall obligate the successful proposer to indemnify the Town Indemnified Parties against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of the Town Indemnified Parties.

In any and all claims against the Town Indemnified Parties made or brought by any employee of the successful proposer, or anyone directly or indirectly employed or contracted with by the successful proposer, or anyone for whose acts or omissions the successful proposer is or may be liable, the successful proposer's obligations under this section shall not be limited by any

limitation on the amount or type of damages, compensation or benefits payable by the successful proposer under workers' compensation acts, disability benefit acts, or other employee benefits acts.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this section, which obligations shall survive the termination or expiration of this RFP and the Contract.

As a municipal agency of the State of Connecticut, the Town will NOT defend, indemnify, or hold harmless the successful proposer.

b. ADVERTISING

The successful proposer shall not name the Town in any advertising, news releases, or promotional efforts without the Town's prior written approval.

If it chooses, the successful proposer may list the Town in a Statement of References or similar document required as part of its response to a public procurement. The Town's permission to the successful proposer to do so is not a statement about the quality of the successful proposer's work or the Town's endorsement of the successful proposer:

c. W-9 FORM

The successful proposer must provide the Town with a completed W-9 form before Contract execution.

d. PAYMENTS

Proposers are encouraged to offer discounts for early payment. All other payments are to be made 30 days after the appropriate Town employee receives and approves the invoice, unless otherwise specified in the Specifications or Contract.

In each of its contracts with subcontractors or materials suppliers, the successful proposer shall agree to pay any amounts due for labor performed or materials furnished not later than thirty (30) days after the date the successful proposer receives payment from the Town that encompasses the labor performed or materials furnished by such subcontractor or material supplier. The successful proposer shall also require in each of its contracts with subcontractors that such subcontractor shall, within thirty (30) days of receipt of payment from the successful proposer, pay any amounts due any sub-subcontractor or material supplier, whether for labor performed or materials furnished.

Each payment application or invoice shall be accompanied by a statement showing the status of all pending change orders, pending change directives and approved changes to the Contract. Such statement shall identify the pending change orders and pending change directives, and shall include the date such change orders and change directives were initiated, additional cost and/or time associated with their performance and a description of any work completed. The successful proposer shall require each of its subcontractors and suppliers to include a similar statement with each of their payment applications or invoices.

e. TOWN INSPECTION OF WORK

The Town may inspect the successful proposer's work at all reasonable times. This right of inspection is solely for the Town's benefit and does not transfer to the Town the responsibility for discovering patent or latent defects. The successful proposer has the sole and exclusive responsibility for performing in accordance with the Contract.

f. REJECTED WORK OR MATERIALS

The successful proposer, at its sole cost and expense, shall remove from the Town's property rejected items, commodities and/or work within 48 hours of the Town's notice of rejection. Immediate removal may be required when safety or health issues are present.

g. MAINTENANCE AND AVAILABILITY OF RECORDS

The successful proposer shall maintain all records related to the work described in the RFP for a period of five (5) years after final payment under the Contract or until all pending Town, state and federal audits are completed, whichever is later. Such records shall be available for examination and audit by Town, state and federal representatives during that time, at no cost to the Town.

h. SUBCONTRACTING

Prior to entering into any subcontract agreement(s) for the work described in the Contract, the successful proposer shall provide the Town with written notice of the identity (full legal name street address, mailing address (if different from street address), and telephone number) of each proposed subcontractor. The Town shall have the right to object to any proposed subcontractor by providing the successful proposer with written notice thereof within seven (7) business days of receipt of all required information about the proposed subcontractor. If the Town objects to a proposed subcontractor, the successful proposer shall not use that subcontractor for any portion of the work described in the Contract.

All permitted subcontracting shall be subject to the same terms and conditions as are applicable to the successful proposer. The successful proposer shall remain fully and solely liable and responsible to the Town for performance of the work described in the Contract. The successful proposer also agrees to promptly pay each of its subcontractors within thirty (30) days of receipt of payment from the Town or otherwise in accordance with law. The successful proposer shall assure compliance with all requirements of the Contract. The successful proposer shall also be fully and solely responsible to the Town for the acts and omissions of its subcontractors and of persons employed, whether directly or indirectly, by its subcontractor(s).

i. PREVAILING WAGES

State law may require that wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker under the Contract and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in Conn. Gen. Stat. § 31-53, as amended, 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. A successful proposer 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 pay day. Upon Contract award, the successful proposer must certify under oath to the State Labor Commissioner the pay scale to be used by the successful proposer and its subcontractors.

j. PREFERENCES

As required by statute, regulation or other applicable law, Respondent and any Subcontractor shall monitor and track MBE and WBE, local workforce and overall labor participation, including Set Aside documentation. If this Project is funded in whole or in part by funds from the State of Connecticut, Public Act 15-5 (§§58-71 and 88) requires that, effective with all contracts executed after October 1, 2015, all solicitations for municipal public works contracts funded in whole or in part with State funds

state in the notice of solicitation that the contract must comply with the set asides mandated by Public Act 15-5. The set aside requirements include a requirement that 25% of the total value of contracts in excess of \$50,000.00 be set aside for exclusive bidding for "small contractors," as defined by Section 58 (a) (1), and 25% of such amount (that is, 6.25% of the total value), be set aside for "minority business enterprises," as defined by Section 58(a) (4). For contracts in excess of \$50,000.00, Respondent must have obtained Commission approval of their Affirmative Action Plan prior to contract execution. Respondent is expressly directed to review Public act 15-5, sections 58-71 and 88, to familiarize itself with the requirements of such laws. The Town also directs Respondent's attention to sections 63 and 64 (non-discrimination requirements) and 66-68 (affirmative action requirements).

The Respondent agrees and warrants that in the performance of the Contract such Respondent 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, sexual orientation, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Respondent that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut. The Respondent 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 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 Respondent that such disability prevents performance of the work involved; (2) the Respondent agrees, in all solicitations or advertisements for employees placed by or on behalf of the Respondent, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the commission; (3) the Respondent agrees to provide each labor union or representative of workers with which such Respondent has a collective bargaining agreement or other contract or understanding and each vendor with which such Respondent has a contract or understanding, a notice to be provided by the commission advising the labor union or workers' representative of the Respondent's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Respondent 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, 46a-68f and 46a-86; (5) the Respondent 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 Respondent as relate to the provisions of this section and section 46a-56.

Any Respondent who is a party to a municipal public works contract or quasi-public agency project, where any such contract is valued at less than \$50,000 for each year of the contract, shall provide the Commission on Human Rights and Opportunities with a written or electronic representation that complies with the nondiscrimination agreement and warranty under subsection (A)(1) above, provided if there is any change in such representation, the Respondent shall provide the updated representation to the Commission not later than 30 days after such change. Any Respondent who is a party to a municipal public works contract or a quasi-public agency project, where any such contract is valued at \$50,000 or more for any year of the contract, shall provide the Commission with any one of the following: (1) Documentation in the form of a company or corporate policy adopted by resolution of the board of directors, shareholder, managers, members or other governing body of such Respondent that complies with the nondiscrimination agreement and warranty under subsection (A)(1) of this section; (2) 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 Respondent if (a) 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 the executive director of the Commission on Human Rights and Opportunities or designee certifies that the prior resolution

complies with the nondiscrimination agreement and warranty under subdivision (A)(1) of this section; or (3) 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 (A)(1) of this section and is in effect on the date the affidavit is signed..

"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. Determination of the Respondent's good faith efforts shall include, but shall not be eliminated to, the following factors: The Respondent'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 on Human Rights and Opportunities may prescribe that are designed to ensure the participation of minority business enterprises in municipal public works contracts or quasi-public agency projects. "Municipal public works project" means that portion of an agreement entered into on or after October 1, 2015, between any individual, firm or corporation and a municipality for the construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, which is financed in whole or in part by the state, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees but excluding any project of an alliance district, as defined in section 10-262u, finance by the state funding in an amount equal to fifty thousand dollars or less. "Quasi-public agency project" means the construction, rehabilitation, conversion, extension, demolition or repair of a building or other changes or improvements in real property pursuant to a contract entered into on or after October 1, 2015, which is financed in whole or in part by a quasi-public agency using state funds, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

The successful proposer shall comply with the requirements of Conn. Gen. Stat. § 31-52(b), as amended. Specifically, the successful proposer agrees that in the employment of labor to perform the work under the Contract, preference shall be given to citizens of the United States who are, and have been continuously for at least three (3) months prior to the date of the Contract, 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 New Haven County 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 (3) months prior to the date of the Contract.

k. WORKERS COMPENSATION

[Under Conn. Gen. Stat. § 31-286a, a municipality may not enter into "any contract ... for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project before receiving from each of the other parties to such contract (1) sufficient evidence of compliance with the workers' compensation insurance and self-insurance requirements of subsection (b) of section 31-284, and (2) a current statement from the State

Treasurer that, to the best of his knowledge and belief, as of the date of the statement, the particular party was not liable to the state for any workers' compensation payments made pursuant to section 31-355"(emphasis added).

Ursula Tschinkel at the State Treasurer's office is the current contract for obtaining statements. Ursula.tschinkel@ct.gov (860) 702-3250.

Prior to Contract execution, the Town will require the tentative successful proposer to provide a current statement from the State Treasurer that, to the best of her knowledge and belief, as of the date of the statement, the tentative successful proposer was not liable to the State for any workers' compensation payments made pursuant to Conn. Gen. Stat. § 31-355.

1. SAFETY

The successful proposer and each of its permitted subcontractors shall furnish proof that each employee performing the work of a mechanic, laborer or worker under the Contract has completed a course of at least ten (10) hours 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. Such proof shall be provided with the certified payroll submitted for the first week each such employee, mechanic, laborer, or worker begins work under the Contract.

m. COMPLIANCE WITH LAWS

The successful proposer shall comply with all applicable laws, regulations, ordinances, codes and orders of the United States, the State of Connecticut and the Town related to its proposal and the performance of the work described in the Contract, including but not limited to:

.1 Non-Discrimination and Affirmative Action. Proposer, in performing under this contract, shall not discriminate against any worker, employee or applicant, or any member of the public, because of race, creed, color, age, marital status, sexual orientation, national origin, ancestry, sex, mental retardation or physical disability, including but not limited to blindness, unless it is shown by the Proposer that such disability prevents performance of the work involved in any manner prohibited by the laws of the United States or the State of Connecticut, nor otherwise commit an unfair employment practice. Proposer further agrees that this article, (and any additional provisions required by law), will be incorporated by Proposer in all contracts entered into with suppliers of materials or services contractors and subcontractors and all labor organizations, furnishing skilled, unskilled and craft union skilled labor or who may perform any such labor or services in connection with this contract. The following principles and requirements of Equal Opportunity and Affirmative Action, as incorporated herein, will be incorporated into "Equal Opportunity - Non-Discrimination Clause" are hereby deemed to be included in all Town bid documents, purchase orders, lease and contracts entered into with the Town. The principles of Affirmative Action are addressed in the 13th, 14th and 15th Amendments of the United States Constitution, Civil Rights Act of 1964, Equal Pay Act of 1963, Title VI and VII of the 1964 United States Civil Rights Act,

Presidential Executive Orders 11246, 11375, 11478 (nondiscrimination under federal contracts), Act 1, Section 1 and 20 of the Connecticut Constitution, Governor Grasso's Executive Order Number 11, Governor O'Neill's Executive Order Number 9, the Connecticut Fair Employment Practices Law (Sec. 46a-60-69) of the Connecticut General Statutes (CGS), Connecticut Code of Fair Practices (46a-70-81), Deprivation of Civil Rights (46a-58 (a)(d)), Public Accommodations Law (46a-63-64), Discrimination against Criminal Offenders (46a-80), definition of blind (46a-51(1)), definition of Physically Disabled (46a-51 (15)), definition of Mentally Retarded (46a-51-13), cooperation with the Commission on Human Rights and Opportunities (46a-77), Sexual Harassment (46a-60 (a)-8), Connecticut Credit Discrimination Law (360436 through 439), Title 1 of the State and the Local Fiscal Assistance Act 1 1972.

If a project is funded in whole or in part by State funds, CGS Sections 46a-68c through 46a-68k apply to contractors. These Sections trigger affirmative action plan requirements for contractors and the filing of compliance reports with the State by contractors.

- .2 **Executive Orders.** The contract may be subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgate June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgate February 15, 1973, concerning the listing of employment opening and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgate April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.
- .3 **Connecticut's Prevailing Wage Law Provision.** If applicable, the Proposer must be in full compliance with CGS Section 31-53 and 31-53(a) which applies to each contract for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration, or repair of any public works project by the state or its agents, or by any political subdivision of the State, CGS Section 31-53 (g) provides monetary thresholds which must be met before the law is applicable. In accordance with CGS Section 31-53, projects are subject to the payment of minimum prevailing wages where the total cost of all work to be performed by all contractors and subcontractors in connection with new construction of any public works project is **\$1,000,000** or more and where the total cost of all work to be performed by all contractors and subcontractors in connection with any remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project is **\$100,000** or more. For qualifying projects, all contractors and subcontractors shall submit to the Finance Department certified weekly payrolls for all contracts meeting the stated monetary limits. The certified payrolls shall be submitted to the Finance Department with the Proposer's monthly certificate for payment. The Proposers should familiarize

themselves with all aspects of the provisions under state law in order to ensure full compliance.

- .4 **Occupational Safety and Health Administration Requirements.** According to CGS, Section 31-53b (a) each contract entered into on or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by a 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 **\$100,000** shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building , pursuant to such contract, have completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268. The aforesaid provisions shall be deemed to be incorporated into the Contract with the Town. The contractors should familiarize themselves with all aspects of state law and any applicable regulations pertaining to these requirements in order to ensure full compliance.

- .5 **Payment Bond/Performance Bond State Law Requirements.** CGS Section 49-41, known as the Little Miller Act, requires that the Town ensure that payment bonds a/k/a labor and materials bond in the amount of the contract are provided for public works projects over **\$100,000**. When a contract for construction, alteration, remodeling, repair or demolition of any public building is estimated to cost more than **\$500,000** additional laws/requirements apply. The contractors should familiarize themselves with all aspects of state law and any applicable regulations pertaining to these requirements in order to ensure full compliance.

- .6 **State of Connecticut Contractor Prequalification Program.** CGS Section 4b-91 requires all bidders for the construction, alteration, remodeling, repair or demolition of any public building or any other public work by a public agency (includes a municipality) that is paid for, in whole or in part, with state funds and that is estimated to cost more than **\$500,000**, except a public highway or bridge project or any other construction project administered by DOT, shall be prequalified with the State pursuant to CGS Section 4a-100. Once a contractor is prequalified, it is issued a prequalification certificate by DAS, which certificate is in effect for one year. Subcontractors' work, the cost of which may exceed **\$500,000**, are also required to be prequalified. Any bid for a project that requires prequalification must include a copy of the bidder's Prequalification Certificate showing the aggregate work capacity rating required under the contract and the Update (Bid) Statement showing renewal of certificate and/or change in aggregate work capacity. Bids which do not include a copy of the Prequalification Certificate and the Update (Bid) Statement are invalid. Contractors should contact the State Department of Administrative Services to familiarize themselves with these requirements.

.7 Non-Resident Contractor 5% Tax For Contracts.

CGS Section 12-430(7) requires non-resident contractors who perform services or furnish materials, or both, for the construction, alteration or improvement of any project in which the contract price is at least **\$250,000**, to furnish the Department of Revenue Services (DRS) a Guarantee Bond for 5% of the total cost of the work, issued under a contract using Form AU-766, Guarantee Bond. This form is available on the State DRS website. Form AU-766 must be submitted for each additional change order or supplement issued against the contract. Non-resident contractors must have completed and submitted to the DRS Form REG-1, Business Tax Registration Application, to register with the DRS and have been issued a Connecticut Tax Registration Number. This form is available on the DRS website. Non-resident contractors have 120 days from the commencement of the contract to file the Guarantee Bond with the State. Commencement of the contract, as defined by law, “means the time when the non-resident contractor signs the contract, but, in any event, occurs no later than when the work under the contract actually starts.” As soon as the guarantee bond is filed with the DRS, the non-resident contractor shall submit the copy of such Guarantee Bond together with the non-resident contractor’s Connecticut Tax Registration Number to the Town department for whom the project is required. After the non-resident contractor receives its Certificate of Compliance from the DRS confirming that the Guarantee Bond requirement has been met, the non-resident contractor shall submit a copy of the same to the department, for whom the work is being performed, with a copy to the Purchasing Department.

.8 Equal Employment Opportunity (EEO); Minority Business Enterprises (MBE)

If a project is funded in whole or in part by state or federal funds, there may be a requirement that the contractor comply with CGS Section 4a-60 and applicable State regulations. On these projects it will depend upon which set-aside requirements are imposed by the funding agency. If no set-aside requirement is imposed, a statement that the Proposer is required to undertake good faith efforts to include subcontractors and suppliers who are minority business enterprises will suffice and shall be deemed to be incorporated into the Contract with the Town. If there is a set-aside goal, the Town and Proposer shall comply with the Small Contractors Set-Aside Program and the hiring goals identified by the State Commission on Human Rights and Opportunities (CHRO.)

- .9 If a project or program is funded in whole or in part with federal funds, the Federal Uniform Guidance Procurement Standards, 2 *CFR* §§ 200.317-200.327, shall apply and full compliance by Proposer with same shall be required.

6. LICENSES AND PERMITS

The successful proposer certifies that, throughout the Contract term, it shall have and provide proof of all approvals, permits and licenses required by the Town and/or any state or federal authority. The successful proposer shall immediately and in writing notify the Town of the loss or suspension of any such approval, permit or license.

7. AMENDMENTS

The Contract may not be altered or amended except by the written agreement of both parties.

8. ENTIRE AGREEMENT

It is expressly understood and agreed that the Contract contains the entire agreement between the parties, and that the parties are not, and shall not be, bound by any stipulations, representations, agreements or promises, oral or otherwise, not printed or inserted in the Contract or its attached exhibits.

9. VALIDITY

The invalidity of one or more of the phrases, sentences or clauses contained in the Contract shall not affect the remaining portions so long as the material purposes of the Contract can be determined and effectuated.

10. CONNECTICUT LAW AND COURTS

The Contract shall be governed by and construed in accordance with the internal laws (as opposed to the conflicts of law provisions) of the State of Connecticut, and the parties irrevocably submit in any suit, action or proceeding arising out of the Contract to the jurisdiction of the United States District Court for the District of Connecticut or of any court of the State of Connecticut, as applicable.

11. NON-EMPLOYMENT RELATIONSHIP

The Town and the successful proposer are independent parties. Nothing contained in the Contract shall create, or be construed or deemed as creating, the relationships of principal and agent, partnership, joint venture, employer and employee, and/or any relationship other than that of independent parties contracting with each other solely for the purpose of carrying out the terms and conditions of the Contract. The successful proposer understands and agrees that it is not entitled to employee benefits, including but not limited to workers compensation and employment insurance coverage, and disability. The successful proposer shall be solely responsible for any applicable taxes.

END OF STANDARD INSTRUCTIONS TO PROPOSERS

CHESHIRE PUBLIC SCHOOLS
TOWN OF CHESHIRE, CONNECTICUT

PROJECT SPECIFICATIONS FOR
HVAC IMPROVEMENTS AT CHESHIRE HIGH SCHOOL

525 South Main Street
Cheshire CT 06410

BID #2223-10



ISSUED FOR BID
November 04, 2022

ENGINEER



Consulting Engineering Services
811 Middle Street
Middletown CT 06457

www.ceseng.com

ARCHITECT



Cheryl Newton
Architects LLC

Cheryl Newton Architects LLC
39 New London Tpke, Suite 320
Glastonbury, CT 06033

www.cnarchitectsllc.com

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TOWN OF CHESHIRE, CONNECTICUT

INSURANCE REQUIREMENTS FOR
CHESHIRE HIGH SCHOOL HVAC IMPROVEMENTS

PROPOSAL#2223-10

Vendor shall maintain in force at all times during which services are to be performed by vendor, or such longer period as provided by contract, the following coverages placed with company(ies) licensed by the State of Connecticut which have at least an "A-" VIII policyholders rating according to A.M. Best's latest edition Key Rating Guide. The stated policy limits are the minimum coverage amounts required.

		Minimum Limits
General Liability*	Each Occurrence	\$1,000,000
	General Aggregate	\$2,000,000
	Products/Completed Operations Aggregate	\$2,000,000
Auto Liability*	Combined Single Limit	
	Each Accident	\$1,000,000
Umbrella* (Excess Liability)	Each Occurrence	\$1,000,000
	Aggregate	\$1,000,000

* The Town of Cheshire, and its Board of Education shall be named as "Additional Insured".

Coverage is to be provided on a primary, noncontributory basis. Waiver of subrogation to be provided. Higher limits may be required, based on the scope and nature of the services to be provided. If higher limits are required, such limits shall be identified in the Request for Proposal of Invitation to Bid, as well as in the contract issued by the Town. The Town reserves the right to require additional coverages, including, without limitation, Builder's Risk insurance for construction projects and Owner's Protective Liability insurance, if desirable.

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Workers' Compensation and WC Statutory Limits

Employers' Liability	EL Each Accident	\$500,000
	EL Disease Each Employee	\$500,000
	EL Disease Policy Limit	\$500,000

Original, completed Certificates of Insurance must be presented to the Town's Purchasing Agent prior to purchase order issuance and contract execution. Vendor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration of the policy. Should any of the above described policies be cancelled before the expiration date, written notice must be provided to the Town 30 days prior to cancellation. Failure to maintain required insurance coverage shall be a material default of vendor's contract with the Town.

END OF INSURANCE REQUIREMENTS

TOWN OF CHESHIRE, CONNECTICUT

PROPOSAL FORM
CHESHIRE HIGH SCHOOL HVAC IMPROVEMENTS

PROPOSAL#2223-10

PROPOSER'S FULL LEGAL NAME:

Pursuant to and in full compliance with the RFP, the undersigned proposer, having visited the site or property if applicable, and having thoroughly examined each and every document comprising the *RFP*, including any addenda, hereby offers and agrees as follows:

To provide the products and/or services specified in, and upon the terms and conditions of, the RFP for the total sum of _____
-----'--"/100Dollars (write out in words) (\$_____),

ACKNOWLEDGEMENT

In submitting this Proposal Form, the undersigned proposer acknowledges that the price(s) include all labor, materials, transportation, hauling, overhead, fees and insurances, bonds or letters of credit, profit, security, permits and licenses, and all other costs to cover the completed work called for in the RFP. Except as otherwise expressly stated in the RFP, no additional payment of any kind will be made for work accomplished under the price(s) as proposed.

REQUIRED DISCLOSURES

- a. Exceptions to the RFP

This proposal does not take exception to any requirement of the RFP, including but not only any of the Contract Terms set forth in Section 26 of the Standard Instructions to Proposers.

- b. State Debarment List

Is the proposer on the State of Connecticut's Debarment List?

YES
 NO

c. Occupational Safety and Health Law Violations

Has the proposer or any firm, corporation, partnership or association in which it has an interest (1) been cited for three (3) or more willful or serious violations of any occupational safety and health act or of any standard, order or regulation promulgated pursuant to such act, during the three-year period preceding the proposal (provided such violations were cited in accordance with the provisions of any state occupational safety and health act or the Occupational Safety and Health Act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency or court having jurisdiction) or (2) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the proposal?

--- Yes
--- No

If "yes," attach a sheet fully describing each such matter.

d. Arbitration/Litigation

Has either the proposer or any of its principals (regardless of place of employment) been involved for the most recent ten (10) years in any resolved or pending arbitration or litigation?

--- Yes
--- No

If "yes," attach a sheet fully describing each such matter.

e. Criminal Proceedings

Has the proposer or any of its principals (regardless of place of employment) ever been the subject of any criminal proceedings?

--- Yes
--- No

If "yes," attach a sheet fully describing each such matter.

f. Has the proposer failed to complete work awarded to it or been declared in default in the past 5 years?

g. Ethics and Offenses in Public Projects or Contracts

Has either the proposer or any of its principals (regardless of place of employment) ever been found to have violated any state or local ethics law, regulation, ordinance, code, policy or standard, or to have committed any other offense arising out of the submission of proposals or bids or the performance of work on public works projects or contracts?

--- Yes
--- No

If "yes," attach a sheet fully describing each such matter.

NOTE: THIS DOCUMENT, IN ORDER TO BE CONSIDERED A VALID PROPOSAL, MUST BE SIGNED BY A PRINCIPAL OFFICER OR OWNER OF THE BUSINESS ENTITY THAT IS SUBMITTING THE PROPOSAL. SUCH SIGNATURE CONSTITUTES THE PROPOSER'S REPRESENTATIONS THAT IT HAS READ, UNDERSTOOD AND FULLY ACCEPTED EACH AND EVERY PROVISION OF EACH DOCUMENT COMPROMISING THE RFP, UNLESS AN EXCEPTION IS DESCRIBED ABOVE. PROPOSER AGREES THAT IT WILL SIGN CONTRACT PROVIDED BY THE TOWN, WITHOUT MODIFICATIONS OR ALTERATIONS, WITHIN FIVE (5) DAYS OF AWARD.

BY.....
(PRINT NAME)

TITLE:.....

(SIGNATURE)

DATE:.....

END OF PROPOSAL FORM

TOWN OF CHESHIRE, CONNECTICUT

PROPOSER'S LEGAL STATUS DISCLOSURE

Please fully complete the applicable section below, attaching a separate sheet if you need additional space.

For purposes of this disclosure, "permanent place of business" means an office continuously maintained, occupied and used by the proposer's regular employees regularly in attendance to carry on the proposer's business in the proposer's own name. An office maintained, occupied and used by a proposer only for the duration of a contract will not be considered a permanent place of business. An office maintained, occupied and used by a person affiliated with a proposer will not be considered a permanent place of business of the proposer.

IF A SOLELY OWNED BUSINESS:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business under sole proprietor or trade name _____

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

Yes _ _ _ _ No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

IF A CORPORATION:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Officers

President

Secretary

Chief Financial Officer

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

Yes

No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

IF A LIMITED LIABILITY COMPANY:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Manager(s) and Member(s) ·

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

Yes _____ No _____

If yes, please state the full street address (not a post office box) of that "permanent place of business."

IF A PARTNERSHIP:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Partners

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Name & Title (if any) Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

Yes _____ No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

Sign on the next page

Proposer's Full Legal Name

(print)

Name and Title of Proposer's Authorized Representative

(signature)

Proposer's Representative, Duly Authorized

Date

END OF LEGAL STATUS DISCLOSURE FORM

TOWN OF CHESHIRE, CONNECTICUT

PROPOSAL #2223-10
(DESCRIBE SUBJECT MATTER OF PROPOSAL!)

PROPOSER'S CERTIFICATION
Concerning Equal Employment Opportunities
And Affirmative Action Policy

I/we, the proposer, certify that:

- 1) I/we are in compliance with the equal opportunity clause as set forth in Connecticut state law (Executive Order No. Three, <http://www.cslib.org/exeorder3.htm>).
- 2) I/we do not maintain segregated facilities.
- 3) I/we have filed all required employer's information reports.
- 4) I/we have developed and maintain written affirmative action programs.
- 5) I/we list job openings with federal and state employment services.
- 6) I/we attempt to employ and advance in employment qualified handicapped individuals.
- 7) I/we are in compliance with the Americans with Disabilities Act.
- 8) I/we (check one):
 have an Affirmative Action Program, or

 employ 10 people or fewer.
- 9) I/we have read and understand the RFP Documents and all addenda and our proposal has been made on the basis thereof.

Legal Name of Proposer

(signature)
Proposer's Representative, Duly Authorized

Name of Proposer's Authorized
Representative

Title of Proposer's Authorized Representative

Date

TOWN OF CHESHIRE, CONNECTICUT

PROPOSER'S NON COLLUSION AFFIDAVIT

PROPOSAL FOR:

PROPOSAL NUMBER:

The undersigned proposer, having fully informed himself/herself/itself regarding the accuracy of the statements made herein, certifies that:

- (1) the proposal is genuine; it is not a collusive or sham proposal;
- (2) the proposer developed the proposal independently and submitted it without collusion with, and without any agreement, understanding, communication or planned common course of action with, any other person or entity designed to limit independent competition;
- (3) the proposer, its employees and agents have not communicated the contents of the proposal to any person not an employee or agent of the proposer and will not communicate the proposal to any such person prior to the official opening of the proposal; and
- (4) no elected or appointed official or other officer or employee of the Town of Cheshire is directly or indirectly interested in the proposer's proposal, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.

The undersigned proposer further certifies that this affidavit is executed for the purpose of inducing the Town of Cheshire to consider its proposal and make an award in accordance therewith.

Legal Name of Proposer

(signature)

Proposer's Representative, Duly Authorized

Name of Proposer's Authorized
Representative

Title of Proposer's Authorized Representative

Date

Subscribed and sworn to before me this ____ day of _____, 20__.

Notary Public

My Commission Expires:

TOWN OF CHESHIRE, CONNECTICUT

PROPOSAL #2223-10
CHESHIRE HIGH SCHOOL HVAC IMPROVEMENTS

PROPOSER'S STATEMENT OF REFERENCES

Provide at least three (3) references:

1. BUSINESS NAME.....
ADDRESS.....
CITY, STATE
TELEPHONE:
INDIVIDUAL CONTACT NAME AND POSITION _ _ _ _ _

2. BUSINESS NAME.....
ADDRESS.....
CITY, STATE.....
TELEPHONE:
INDIVIDUAL CONTACT NAME AND POSITION _ _ _ _ _

3. BUSINESS NAME.....
ADDRESS.....
CITY, STATE
TELEPHONE:
INDIVIDUAL CONTACT NAME AND POSITION _ _ _ _ _

END OF STATEMENT OF REFERENCES

CONTRACT FOR CHESHIRE HIGH SCHOOL HVAC IMPROVEMENTS

This Contract is made as of the ____ day of _____, 20__ (the "Effective Date"), by and between the Town of Cheshire, 84 South Main Street, Cheshire, Connecticut, a municipal corporation organized and existing under the laws of the State of Connecticut (the "Town"), and [name and address of successful proposer/ (the "Contracting Party")-

RECITALS:

WHEREAS, the Town has issued a Request for Proposals for *the removal of old unit ventilators and provide rooftop air handling units to improve indoor air quality in the classrooms though ventilation heating and cooling and related construction.*

(the "RFP"), a copy of which, along with any addenda, is attached as Exhibit A;

WHEREAS, the Contracting Party submitted a proposal to the Town dated _____ (the "Proposal"), a copy of which is attached as Exhibit B;

WHEREAS, the Town has selected the Contracting Party to perform the Work (as defined in Section 1 below); and

WHEREAS, the Town and the Contracting Party desire to enter into a formal contract for the performance of the Work.

NOW THEREFORE, in consideration of the recitals set forth above and the parties' mutual promises and obligations contained below, the parties agree as follows:

1. Work: The Contracting Party agrees to perform the Work described more fully in the attached Exhibits A (collectively, the "Work").

The Contracting Party also agrees to comply with all of the terms and conditions set forth herein and in the RFP, including but not only **all of the terms set forth in Section 26 (the "Contract Terms") of the Standard Instructions to Bidders.**

2. Term: *[placeholder - will vary from contract to contract]*

3. Contract Includes Exhibits: Order of Construction: The Contract includes the RFP (Exhibit A) and the Proposal (Exhibit B), which are made a part hereof. In the event of a conflict or inconsistency between or among this document, the RFP, and the Proposal, this document shall have the highest priority, the RFP the second priority, and the Proposal the third priority.

4. Price and Payment: *{placeholder - will vary from contract to contract. If contract extends beyond current fiscal year, be sure to include non-appropriation language.}*

5. Right to Terminate - If the Contracting Party's fails to comply with any of the terms, provisions or conditions of the Contract, including the exhibits, the Town shall have the right, in addition to all other available remedies, to declare the Contract in default and, therefore, to terminate it and to resubmit the subject matter of the Contract to further public procurement. In that event, the Contracting Party shall pay the Town, as liquidated damages, the amount of any excess of the price of the new contract over the Contract price provided for herein, plus any legal or other costs or expenses incurred by the Town in terminating this Contract and securing a new contracting party.

6. No Waiver or Estoppel - Either party's failure to insist upon the strict performance by the other of any of the terms, provisions and conditions of the Contract shall not be a waiver or create an estoppel. Notwithstanding any such failure, each party shall have the right thereafter to insist upon the other party's strict performance, and neither party shall be relieved of such obligation because of the other party's failure to comply with or otherwise to enforce or to seek to enforce any of the terms, provisions and conditions hereof.

7. Notice - Any notices provided for hereunder shall be given to the parties in writing (which may be hardcopy, facsimile, or e-mail) at their respective addresses set forth below:

If to the Town:

[name, address, fax and e-mail]

8. Execution - This Contract may be executed in one or more counterparts, each of which shall be considered an original instrument, but all of which shall be considered one and the same agreement, and shall become binding when one or more counterparts have been signed by each of the parties hereto and delivered (including delivery by facsimile) to each of the parties.

IN WITNESS THEREOF, the parties have executed this contract as of the last date signed below.

TOWN OF CHESHIRE

By _____
Michael A. Milone
Its Town Manager, Duly Authorized
Date: _____

[CONTRACTING PARTY LEGAL NAME]

By _____
Its _____, Duly Authorized
Date:

DRAFT AIA® Document A101™ - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the «**1**» day of «**1**» in the year «**2017**»
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«**1**» «**1**» «**Town of Cheshire**
»84 South Main Street
Cheshire, CT 06410 »

and the Contractor:
(Name, legal status, address and other information)

«

« for the following Project:
HVAC Improvements at Cheshire High School
525 South Main Street
Cheshire CT 06410

«

The Architect:
Cheryl Newton Architects LLC
39 New London Tpke, Suite 320
Glastonbury, CT 06033

The Engineer:
Consulting Engineering Services
811 Middle Street
Middletown CT 06457

« »

« The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, the Bidding Documents (including Owner's Instructions to Bidders, Owner's Invitation to Bid # and all Bidding Documents issued in conjunction therewith, including Addendum #1), Contractor's Bid dated _____, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

The date of this Agreement.

A date set forth in a notice to proceed issued by the Owner or Architect. Contractor shall coordinate the scheduling and performance of the Work with the Owner.

Established as follows:

(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

[] Not later than «ten» («10») months from the date of commencement of the Work.

[X] By the following date: «_____»

TIME IS OF THE ESSENCE WITH REGARD TO THE TIMELY PERFORMANCE OF THE AGREEMENT, ACHIEVEMENT OF ALL MILESTONES, SUBSTANTIAL COMPLETION AND FINAL COMPLETION OF THE PROJECT BY THE CONTRACTOR. If, in the sole opinion of the Owner, the Contractor is not adhering to the Project schedule and/or is not supplying sufficient labor and/or equipment to complete the Work by the Substantial Completion date contained herein, upon forty-eight (48) hours written notice, the Town shall have the right to direct the Contractor to increase its labor and/or equipment to meet established project schedules without additional compensation provided the Town is not responsible or in any way liable for the Contractor not adhering to the Project schedule. Any and all such additional labor or supervision shall be at Contractor's sole cost and expense and may include, but shall not be limited to, Town directing the Contractor to increase the workers on its crews, supply additional equipment, work overtime, work a second shift during a single day, work weekends, or any combination thereof, without any additional compensation being due to Contractor for such additional personnel. Any costs incurred or arising due to the Contractor's failure to achieve timely Substantial Completion shall be borne solely by the Contractor.

§ 3.3.1.1 Contractor expressly agrees, notwithstanding any provision in this Agreement to the contrary, that: (i) a COVID-19 pandemic exists worldwide as of the execution date of this Agreement; (ii) the existence of such pandemic, and its effects, now, and for the duration of Contractor's performance under the Agreement, shall not in and of itself be cause for Contractor to rely upon, invoke, or avail itself to, any rights or remedies under this Agreement, at law, or in equity, for a claim, or an adjustment to the price, schedule, quantities, specifications, or other material terms of this Agreement; (iii) the material terms of this Agreement, particularly terms relating to price, schedule, quantities, availability and specifications, take into consideration, and fully account for, the existence of such pandemic and its effects, as of the date of this Agreement; and (iv) such pandemic shall not render Contractor unable to fulfill any of its obligations under the Agreement, and Contractor shall not have any claim, action, or cause of action against the Owner in connection with such pandemic, including any claim for frustration of purpose change in circumstances, economic balance, or impossibility. This provision shall survive the completion or earlier termination of this Agreement.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
« »	

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be «_____» (\$ «_____»), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
«None »	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
«N/A »		

§ 4.3 Allowances, if any, included in the Contract Sum: (Identify each allowance.)

Item	Price
«As indicated in the Bid Proposal »	

§ 4.4 Unit prices, if any: (Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
«As indicated in the Bid Proposal »		

§ 4.5 Liquidated damages, if any: (Insert terms and conditions for liquidated damages, if any.)

«See A201 as modified. »

§ 4.6 Other: (Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the «25th » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than thirty (30) days after the Owner approves the Application for Payment. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than «thirty » («30 ») days after the approves the Application for Payment certified by the Architect. (Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« Five percent (5%) »

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

«N/A »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

«At the Owner's sole discretion. »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

Owner shall be entitled to retain two hundred percent (200%) of the estimated cost to complete punchlist items to reach Final Completion.

« »

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect and all conditions precedent to final payment have been satisfied.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

« »

§ 5.3 Intentionally Deleted.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker. (If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »
« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows: (Check the appropriate box.)

[] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[] Litigation in a court of competent jurisdiction

[] Other (Specify)

«Litigation in Connecticut Superior Court in and for the Judicial District of New Haven unless the Owner, in its sole discretion, elects to arbitrate a dispute..»

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 Intentionally Deleted.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

«To be named by the Owner in writing within ten (10) days of the execution of this Agreement. »
« »
« »
« »
« »
« »

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

« To be named by the Contractor in writing within ten (10) days of the execution of this Agreement »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, as modified
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013 incorporated into this Agreement.)

<>

5 Drawings Dated February 4, 2022

Number	Title	Date
See List of Drawings		

6 Specifications

Section	Title	Date	Pages
See Table of Contents			

7 Addenda, if any:

Number	Date	Pages
<>		

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[>] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
<>			

9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

- « Town of Cheshire, Invitation to Bid
- Instructions to Bidders, AIA A701, and Supplemental Instructions to Bidders
- State of CT, Prevailing Wage Rates
- Contractor’s Bid Proposal including all Addenda
- HVAC Improvements at Cheshire High School Drawings and Specifications Dated February 4, 2022

This Agreement entered into as of the day and year first written above.

<>

 OWNER (Signature)

 <><>

 (Printed name and title)

<>

 CONTRACTOR (Signature)

 <><>

 (Printed name and title)

DRAFT AIA® Document A201™ - 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

HVAC Improvements at Cheshire High School
525 South Main Street
Cheshire CT 06410

THE OWNER:
(Name, legal status and address)

«Town of Cheshire
84 South Main Street
Cheshire, CT 06410

THE ARCHITECT:
Cheryl Newton Architects LLC
39 New London Tpke, Suite 320
Glastonbury, CT 06033

THE ENGINEER:
Consulting Engineering Services
811 Middle Street
Middletown CT 06457

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- 3 CONTRACTOR
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- 5 SUBCONTRACTORS
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- 8 TIME

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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- 11 INSURANCE AND BONDS
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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, the Bidding Documents (including the Owner's Invitation to Bid # _____ and Instructions to Bidders), Contractor's Proposal, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties. Subcontractors are not intended thirty-party beneficiaries to the Contract and shall have no direct cause of action against the Owner.

In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

- .1 Modifications, with those of later date having precedence over those of earlier date.
- .2 The Agreement, including any amendment to the Agreement included in the bid package.
- .3 Addenda to the Specifications and Drawings, with those of later date having precedence over those of earlier date.
- .4 The General Conditions of the Contract for Construction.
- .5 Specifications and Drawings.

Further, stated dimensions shall take precedence over scaled dimensions; large-scale detail drawings shall take precedence over small-scale drawings; schedules shall take precedence over other data on the drawings.

In the case of an inconsistency between Drawings and Specifications or within either Document in describing the Work, the better quality, greater quantity, or more costly work shall be provided in accordance with the Architect's interpretation.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether performed on or off the site of the Project and whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor, its Subcontractors, Sub-Subcontractors, material suppliers or any other entity for whom the Contractor is responsible to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Contractor's Standard of Care

The Contractor shall be responsible for the performance of the Work as an independent contractor and in a good and workmanlike manner (i) consistent with the Contract Documents; (ii) consistent with the instructions, guidance and direction of the Owner and Architect; (iii) consistent with the highest prevailing applicable professional or industry standards; (iv) consistent with sound practices; (v) as expeditiously as is consistent with such professional skill and care and the orderly progress of the Work and with the Contract Documents and the instructions, guidance and direction of the Owner and Architect; (vi) in a manner that will not exceed the Contract Sum as set forth in the Agreement, and (vii) in strict compliance with applicable laws (the standards of this Section 1.1.8 shall be referred to herein as the "Contractor's Standard of Care"). The Contractor shall exercise the Contractor's Standard of Care in performing all aspects of the Work. All references in the Contract Documents to the knowledge, inference, reliance, awareness, determination, belief, observation, recognition or discovery of the Contractor or reference to any similar term shall include the constructive knowledge, inference, reliance, awareness, determination, belief, observation and recognition attributed to the Contractor ("constructive knowledge"). Such constructive knowledge shall include the knowledge, inference, reliance, awareness, determination, belief, observation and recognition the Contractor would have obtained upon the exercise of the Contractor's Standard of Care.

§ 1.1.9 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

.1 Before ordering materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project site and shall be responsible for the correctness of such measurements. No extra charge or compensation will be allowed on account of minor differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Architect for resolution before proceeding with the Work.

.2 If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure for the approval by the Architect before making the change.

§ 1.2.1.2 The Architect may, as he deems desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work reasonably inferable from the Contract Documents; such drawings or instructions may be effected by notice to the Contractor without modification of the contract Time or contract Sum. If the Contractor claims additional cost or delay on account of such additional drawings or instructions, he shall give notice as provided in Subparagraph 15.1.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 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.

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

§ 1.2.4 The Contractor and all Subcontractors shall refer to all of the Drawings, including those showing primarily the Work of the mechanical, electrical and other specialized trades, and to all of the sections of the Specifications, and shall perform all Work reasonably inferable there from as being necessary to produce the indicated results.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Instruments of Service, including the Drawings and Specifications, are and shall be the property of the Owner. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the reserved rights of the Owner.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service for any purpose outside the scope of the Work without the specific written consent of the Owner

§ 1.5.3 Prior to execution of the Agreement, the Contractor evaluated and satisfied itself as to the condition and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools, and equipment, and (v) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Subparagraph 1.5.3.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

§ 1.9 Any information obtained by the Contractor from the Owner or Architect may not be used, published, distributed, sold or divulged by the Contractor or its Subcontractor or Sub-subcontractors for such party's own purposes or for the benefit of any person, firm, corporation or other entity other than the Owner, without the prior written consent of the Owner. Any information obtained by the Contractor of its Subcontractors or Sub-Subcontractors that is designated by the Owner in accordance with applicable law as confidential shall not be disclosed to any other parties without the prior written consent of the Owner.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 INTENTIONALLY OMITTED

§ 2.1.2 INTENTIONALLY OMITTED

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1

INTENTIONALLY OMITTED

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. The Owner has agreed to waive the fees of all required building permits related to the completion of this project

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15. The Owner's right to stop the Work is in addition to and not in restriction or derogation of any and all remedies available to the Owner. The Owner shall have full access to and the right to inspect all portions of the Work for quality, progress, and conformance of the Contract Documents. Any testing or inspections (including commissioning) performed by or on behalf of the Owner shall in no way relieve or replace the obligations of the Contractor in its fulfillment of its obligations hereunder. Any commissioning activities are at the sole discretion of the Owner and shall not be a requirement of the Agreement.

§ 2.6 In no event shall the Owner have control over, charge or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.4 The Contractor shall comply with the Conditions and all local, state, and federal laws, rules and regulations applicable to the Contractor, including without limitation those relating to equal opportunity, labor, wage (including prevailing wage laws) and employment.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, conducted its own due diligence, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary and extensive, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of

any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. . The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or surveys furnished by the Owner, is not guaranteed by the Architect or the Owner. The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner.

§ 3.2.3 Owner assumes no contractual liability or responsibility for the physical condition or safety of the Project site or of any improvement thereon. Except as set forth in Section 10.3, the Contractor shall be solely responsible for providing a safe place for the performance of the Work.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies, or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities. . If the Contractor or a Subcontractor fails to submit a Claim in accordance with the requirements of Article 15, the Contractor or Subcontractor knowingly and irrevocably waives any Claim for additional compensation or time.

§ 3.2.5 The Contractor shall give the Architect timely notice of any additional Drawings, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

§ 3.2.6 The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings or instructions from the Architect as provided in subparagraph 3.2.5. If the Contractor proceeds with such Work without obtaining further Drawings, Specifications or instructions, the Contractor shall correct Work incorrectly done at the Contractor's own expense.

§ 3.2.7 Except as to any reported errors, inconsistencies or omissions, and as to any concealed or unknown conditions as defined in Paragraph 3.7.4. by executing the Agreement, the Contractor represents the following:

1. The Contract Documents are sufficiently complete and detailed for the Contractor to (1) perform the Work required to produce the results intended by the Contract Documents and (2) comply with all the requirements of the Contract Documents.
2. The Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedures and techniques necessary to perform the Work, use of materials, selection of equipment and requirements of product manufacturers are consistent with: (1) good and sound practices within the construction industry; (2) generally prevailing and accepted industry standards applicable to the Work; and (3) requirements of any warranties applicable to the Work.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means,

methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall schedule and perform the Work so as not to unreasonably interfere with any other related or unrelated work being performed by the Owner in or about the Project premises or with the Owner's continued use and operation of the Project premises as a fully operational _____. The Contractor shall protect and prevent damage to all unfinished phases of the Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.2.1 Approval by the Owner or Architect of any such substitution shall not relieve the Contractor requesting the substitution of responsibility for any additional costs incurred by other trades for changes made necessary to accommodate the substituted item.

§ 3.4.2.2 By making requests for substitutions based on subparagraph 3.4.2 above, the Contractor:

- .1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to substitution which subsequently become apparent; and
- .4 shall coordinate the installation of the accepted substitution, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.4.4 The Contractor shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract Documents. The Architect may require the Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the Architect, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the Contractor's expense.

§ 3.4.5 In all cases in which a manufacturer's name, trade name or other proprietary designation is used in connection with materials or articles to be furnished under this Contract, the Contractor shall furnish the product of

the named manufacturer(s) without substitution.

§ 3.4.6 The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall also use best efforts to minimize the likelihood of any strike, work stoppage, or other labor disturbance.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.5.2 Contractor agrees to assign to the Owner as a condition precedent to Substantial Completion of the Work any and all manufacturer's warranties relating to materials and equipment installed in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

§ 3.5.3 The warranty provided in this Paragraph 3.5 shall be in addition to and not in limitation of any other warranty or guaranty required by the Contract Documents or otherwise prescribed by law.

§ 3.5.4 The Contractor shall procure and deliver to the Architect, no later than thirty (30) calendar days after the Date of Substantial Completion, all warranties required by the Contract Documents.

§ 3.5.5 The Warranty shall include the repair and/or replacement of all damaged materials resulting from the defective materials and/or workmanship. This shall include but not be limited to furniture, fixtures, equipment, finishes or any other affected materials or property.

§ 3.6 Taxes

The Owner is a tax-exempt entity. The Contractor shall be familiar with the current regulations of the Connecticut Department of Revenue Services and the sales or use tax on materials or supplies exempted by such regulations shall not be included as part of the bid or the Contract Sum. A sales tax certificate is available upon written request.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure the building permit as well as for other permits, licenses, and inspections by government agencies necessary for proper execution and completion of the Work, including, without limitation, all building permits, subsidiary trade permits, and occupancy permits. All inspection fees as may be imposed by any municipal agency are waived by the Owner.

§ 3.7.1.1 The "Agencies" are the Department of Public Works for the Town of Cheshire (the "Department"), and all other governmental authorities having regulatory or administrative jurisdiction over the Work and/or Project and all representatives or designees of the Department or such other governmental authorities. The term "Agencies" shall also include an individuals or entities designated by the Owner to monitor or oversee compliance of the Project's design with the requirements of governmental authorities having jurisdiction over the Project.

§ 3.7.1.2 The term "Agencies" shall also include an individual or entity not described in Section 3.7.1.1 from whom the Owner intends to request certification of the Project's design, to the extent included in the Contract Documents.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. The Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or any public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary backup material, and furnish the surety with any required personal undertakings. The Owner will pay the price of all such bond premiums.

§ 3.7.3

If the Contractor performs Work which it knows or should know is contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall bear responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide written notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.7.6 If any governmental body having jurisdiction over the Work requires licenses or registrations for the performance of the Work or any part thereof, the Contractor shall hold such valid licenses or registrations as may be required by law to prosecute the Work to completion. If any part of the Work for which such a license or registration is required is to be performed by Subcontractors of any tier, the Contractor shall ensure that such Subcontractors hold such valid licenses or registrations as may be required by law to prosecute said Work to completion.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual

costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Owner or Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.9.4 The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of Work and the storage of materials.

§ 3.9.5 Contractor shall at all times enforce strict discipline and good order among its employees (and those of its Subcontractors) and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to them. All labor shall be performed by workmen skilled in their respective trades and workmanship shall be of good quality in accordance with the standards of construction set forth in the Contract Documents.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information and approval a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The schedule shall set forth milestone dates agreed to by the parties and the failure of the Contractor to achieve a milestone shall constitute a material default hereunder. Failure to meet a milestone date shall entitle but not require the Owner to supplement the Contractor's forces, at the sole cost and expense of the Contractor, and the Contractor shall be solely responsible for coordinating its efforts with and supervising the work of any supplemental manpower.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.10.4 The construction schedule shall be in a detailed precedence-style critical path management ("CPM") format satisfactory to the Owner and the Architect that shall also (i) provide a graphic representation of all activities and events that will occur during performance of the Work; (ii) identify each phase of construction and occupancy; and

(iii) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as “Milestone Dates”). Upon review and acceptance by the Owner and the Architect of the Milestone Dates, the construction schedule shall be deemed part of the Contract Documents. If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Architect and resubmitted for acceptance. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner of any delays or potential delays. The accepted construction schedule shall be updated to reflect actual conditions, as set forth in Subparagraph 3.10.1 or if requested by either the Owner or the Architect. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an adjustment in the Contract Time, any Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

§ 3.10.5 In the event the Owner determines that the performance of the Work, as of a Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (i) working additional shifts or overtime, (ii) supplying additional manpower, equipment, and facilities, and (iii) other similar measures (hereinafter referred to collectively as “Extraordinary Measures”). Such Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner’s right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor’s compliance with the construction schedule.

1. The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner under or pursuant to this Subparagraph 3.10.5.
2. The Owner may exercise the rights furnished the Owner under or pursuant to this Subparagraph 3.10.5 as frequently as the Owner deems necessary to ensure that the Contractor’s performance of the Work will comply with the completion date set forth in the Contract Documents.

§ 3.10.6 The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of the Owner’s premises or any invitees thereof. The Contractor shall, upon the Owner’s request, reschedule any portion of the Work affecting operation of the premises during hours when the premises are in operation. Any postponement or rescheduling under Subparagraph 3.10.5. may be grounds for an extension of the Contract Time if permitted under Subparagraph 8.3.1.

§ 3.10.7 The Contractor shall schedule and conduct construction and progress meetings, on a frequency required to effect coordination, to discuss such matters as procedures, progress, problems, and scheduling. The Contractor shall prepare and distribute minutes within three working days of such meetings.

§ 3.10.8 The Contractor shall record the progress of the Project, including information on each Subcontractor and each Subcontractor’s Work, as well as the entire Project, showing percentages of completion and the number and amounts of Change Orders. The Contractor will keep a daily log containing a record of weather, Subcontractors’ Work on the site, number of workers, Work accomplished, problems encountered and other similar relevant data as the Owner may require. Upon request, Contractor shall make the logs available to the Owner and the Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action. The Contractor's approval shall be noted on the submitted item or in its transmittal letter, together with written notice of any deviation in the submitted item from the requirements of the Work and of the Contract Documents. In collaboration with the Architect, Contractor shall establish and implement procedures for expediting the processing and approval of Shop Drawings, Product Data, Samples, and other submittals.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors. Each Shop Drawing, Product Data, Sample, and similar submittals shall have a cover sheet identifying the project name and address, contractor information, drawing and/or specification reference, submission date and contents of the submittal. Ample space shall be provided on this cover sheet to allow for the Contractor's and Architect's review stamps. The Contractor's approval shall be noted on the submitted items or in its transmittal letter, together with written notice of any deviation in the submitted item from the requirements of the Work and of the Contract Documents.

§ 3.12.6 By submitting and approving Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall indicate approval on the submittals as evidence of such review and coordinate submittals made to the Architect without such indications of approval may be returned to the Contractor for resubmission. The accuracy of all such information is the responsibility of the Contractor. In approving Shop Drawings, Product Data, Samples, and similar submittals, the Architect shall be entitled to rely upon the Contractor's representation that such information is accurate and in compliance with the Contract.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect. If the Contractor procures, performs, or installs portions of the Work without required approvals, the Contractor does so at its own risk and such Work may be removed or replaced with approved Work at no cost to the Owner.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. Any submittals forwarded to the Architect for review that include a deviation from the requirements of the Contract Documents or is not the specific make, model or manufacturer that was listed in the Contract

Documents shall have a completed Substitution Request Form attached to the submittal. This Substitution Request Form shall be provided by the Owner. Unless such deviation is identified by utilizing the Substitution Request Form, the Contractor shall not be relieved of the responsibility for the specific requirements of the Contract Documents even though the subject submittal was approved by the Architect. The Contractor shall not be relieved of responsibility for the Contractor's subcontractor's or vendor's errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional who shall have and maintain reasonable limits of insurance, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.12.10.3 Services provided by the Architect to evaluate Contractor product substitution requests or to review shop drawings or other project submittals which are required to be submitted more than three (3) times shall be paid for by the Contractor to the Owner.

§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that occupied areas adjacent to the site of the Work shall at all time remain free from all debris and building materials.

§ 3.13.3 Other than those reasonably required for safety purposes, the Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

§ 3.13.4 Without limitation of any other provision of the Contract Documents, the Contractor shall use best efforts to

minimize any interference with the occupancy or beneficial use of any areas and buildings adjacent to the site of the Work. Without prior written approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by the Owner.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project and shall clean and/or remove all stains, spots, work, blemishes, foreign matter and dirt from other surfaces not part of the Work but where such conditions resulted from the Contractor's operations.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor for the full cost of such cleanup.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 The Contractor's indemnity obligations under this Paragraph 3.18 shall also specifically include, without limitation, all fines, penalties, damages, liability, costs, expenses (including, without limitation, reasonable attorneys' fees), and punitive damages (if any) arising out of, or in connection with, any (i) violation of or failure to comply with any law, statute, ordinance, rule, regulation, code, or requirement of a public authority that bears upon the performance of the Work by the Contractor, a Subcontractor, or any person or entity for whom either is

responsible, (ii) means, methods, procedures, techniques, or sequences of execution or performance of the Work, and (iii) failure to secure and pay for permits, fees, approvals, licenses, and inspections as required under the Contract Documents, or any violation of any permit or other approval of a public authority applicable to the Work, by the Contractor, a Subcontractor, or any person or entity for whom either is responsible.

§ 3.18.3 The Contractor acknowledges that the subject property upon which the Project is being performed is not lienable because it is municipal government property used for governmental purposes. The Contractor shall indemnify, defend and hold harmless the Owner and the Architect against any and all mechanic's liens placed on the premises or on Owner's interest in the premises by any Subcontractor of any tier or material supplier. In the event that a Subcontractor of any tier or material supplier places a mechanic's lien on the premises, the Contractor shall, with thirty (30) days of the filing of any mechanic's lien, substitute a bond for such lien or cause the lien to be discharged. If the Contractor shall fail to do so, the Owner may, at its option and at the expense of the Contractor, bond such lien or cause the lien to be discharged, and the Contractor will reimburse the Owner for all costs and expenses incurred, including but not limited to attorneys' fees and court costs.

§ 3.18.4 The Contractor shall indemnify, defend, and hold harmless the Owner and the Architect from and against any additional costs or expenses incurred by Owner, including attorneys' fees and court costs, as a result of any claim or cause of action by any Subcontractor or supplier of any tier asserted directly against the Owner to recover payment for labor or materials supplied to the Project, unless such claim or cause of action arises from the failure of the Owner to make payments in accordance with the applicable provisions of the Contract Documents.

§ 3.18.5 The Contractor shall indemnify and hold harmless the Owner, its agents and employees from and against any costs and expenses, including attorneys' fees and court costs, incurred in enforcing any of the Contractor's defense, indemnity, and hold harmless obligations under this Contract.

§ 3.18.6 The Contractor, for itself, its insurers and all subcontractors and their insurers, shall waive governmental immunity as a defense and shall not use the defense of governmental immunity in the adjustment of claims or in the defense of any suit, action or claim brought against the Owner. Nothing herein shall limit the Owner from utilizing the defense of governmental immunity.

§ 3.19 MEETINGS

The Contractor shall send a qualified representative to periodic progress meetings held at such time and at such place as the Architect or the Owner shall designate in accordance with the Contract Documents and to such other meetings as are necessary to comply with the Contract Documents.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction, (i) until the final payment is due, (ii) from time to time during the one year period described in Section 12.2, and (iii) while review or certification of the Project from any of the Agencies is pending.. The Architect will have authority to act on behalf of the Owner only to the extent specified in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will

not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 through 13.4.4, whether or not the Work is fabricated, installed or completed.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of assuring conformity with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract Documents and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 The Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of these interpretations or decisions rendered in good faith which were necessitated by a reason other than an act or omission of the Architect.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. Requests for information shall include, at a minimum, a detailed written statement that indicates the specific element of the Contract Documents in need of clarification and the nature of the clarification requested. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.15 Each Subcontract executed by the Contractor shall include language that instructs the Subcontractor that the Subcontractor is to submit written information requests regarding Contract Document interpretation only to the Contractor and not the Architect. The Contractor shall timely review each such information request and only as necessary, submit to the Architect any information request that in the Contractor's professional judgment is not clearly and unambiguously answered in the Contract Documents.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Owner or Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) either requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.1.1 To facilitate and expedite the investigations of such proposed persons or entities, the Contractor shall submit a statement in writing in sufficient detail to establish that each has the capacity to carry out the portion of the Work such person or entity is proposing to provide. All such submittals shall include a list of principal personnel of any such entity, and an analysis of the financial condition, construction plant, equipment and facilities of any such person or entity. The Contractor shall terminate, at no cost to Owner, any contract with a person or entity to whom the Owner has a reasonable objection if such proposed and rejected subcontractor or such terminated.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but

rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 If the Contractor proposes to substitute a Subcontractor, person, or entity for one previously selected, the parties shall follow the procedures outlined in Section 5.2.1.

§ 5.3 Subcontractual Relations

§ 5.3.1 Any part of the Work performed for the Contractor by a Subcontractor shall be pursuant to a written Subcontract between the Contractor and Subcontractor, which shall be prepared on a form of Subcontract reasonably satisfactory to the Owner in all respects. The Owner shall be a third party beneficiary of all contracts between the Contractor and Subcontractor and all such contracts shall require that the Owner be a third party beneficiary of all contracts between Subcontractors and Sub-Subcontractors. Copies of all Subcontractor bids or proposals shall, upon request of Owner, be submitted to the Owner and Architect.

§ 5.3.2 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and remedies against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.3 The Contractor shall be fully responsible for coordinating and expediting the work of all Subcontractors, and shall employ the necessary and qualified personnel to produce the required quality of labor and materials and to prevent delays in the progress of the Project. The Contractor shall afford each trade with all reasonable opportunities for the installation of its work and for the storage and handling of its materials. The Contractors shall include in the Contractor's bid, any work, in connection with the mechanical trades, to be done by other trades under the Contractor's direct control.

§ 5.3.4 Within thirty (30) calendar days after payment to Contractor by the Owner, the Contractor shall pay any amounts due any Subcontractor, whether for labor performed or materials furnished when such labor or material has been included in requisition submitted by such Contractor and paid by Owner. The Contractor shall promptly give notice to the Owner of any claim or demand by a Subcontractor claiming that any amount is due to such Subcontractor or claiming any default by the Contractor in any of the Contractor's obligations to such Subcontractor.

§ 5.3.5 The Contractor shall include in each of the subcontracts a provision requiring each Subcontractor to pay amounts due to any Sub-Subcontractors, whether for labor performed or materials furnished, within thirty (30) days after such Subcontractor receives a payment from the Contractor which encompasses labor or materials furnished by such Sub-subcontractor and a provision requiring each Subcontractor to promptly any claim or demand by a Sub-subcontractor claiming that any amount is due to such Sub-Subcontractor or claiming any default by such Subcontractor in any of its obligations to such Sub-subcontractor which notice the Contractor shall promptly relay to the Owner.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract but does not accept and shall not be liable for Contractor's obligations prior to the effective date of the assignment. The Contractor agrees to execute any and all other documents required to affect this assignment.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in direct costs resulting from the suspension, provided, however, that no such adjustment will be made to the compensation of a Subcontractor who is compensated as a proportion of the total project cost or a Subcontractor who is in default of its subcontract at the time of assignment.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements.. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, to supplement the Contractor's forces and to award separate contracts in connection with other portions of the Project or other construction or operations on the site. If the Contractor claims that delay or is involved because of such action by the Owner, the Contractor shall make such Claim as is permitted in Articles 8 and 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 INTENTIONALLY OMITTED

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5. If such separate contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense, and if any judgment or award against the Owner arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitration costs which the Owner has incurred.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. The decision as to whether the Change Work is executed via a Change Order, Construction Change Directive, or a minor change in the Work is the decision of the Owner.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 Except as permitted in Paragraph 7.3, a change in the Contract Sum or the Contract Time shall be accomplished only by a written Change Order executed before the Work is performed. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the Contract Time.

§7.2.3 Proposed changes in the Work requested during the construction phase shall be priced by the Contractor and submitted to the Architect and Owner for review, in such form as the Architect and Owner may require, within ten (10) calendar days following the Contractor's receipt of the request. The Contractor shall promptly revise and resubmit such proposal if the Architect and Owner determine that it is not in compliance with the requirements of this Article, or that contains errors of fact or mathematical errors. If required by the Architect or Owner, in order to establish the exact cost of new Work added or previously required Work omitted, the Contractor shall obtain and furnish to the Architect and Owner bona fide proposals from recognized suppliers for furnishing and material included in such Work. Such proposals shall be furnished at the Contractor's expense.

§ 7.2.4 The Contractor's proposal for a change in the Work (Change Order Proposal) shall be itemized completely and shall include: Specific number of calendar days for additional time (if applicable); all material costs and quantities accompanied by the original manufacturer invoices; labor wages; unit prices; subcontractor costs; mark ups; equipment costs, profit, overhead, general conditions, fees, bond costs and approved daily time sheet tickets for work performed under the utilization of labor rates. The Architect's and Owner's refusal to approve a Change Order or Change Order Proposal due to the Contractor's lack of itemized backup information shall not be used to substantiate a claim for additional time.

§ 7.2.5 If the method utilized to execute the Change in the Work is based on labor rates, unit prices and material costs, then actual daily time sheets / tickets, approved by the Superintendent and the Owner, must accompany the Change Order, Construction Change Directive, or minor change in the Work. Not including the actual daily time sheets / tickets, approved by the Superintendent and the Owner, with the Change Order, Construction Change Directive, or minor change in the Work may be cause for their rejection.

§ 7.2.6 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both addition and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly. The Owner may also by Construction Change Directive order work to be performed that has been interpreted by the Owner and Architect to be part of the Work but is disputed by the Contractor through submission of a Claim.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order or work interpreted by the Owner or Architect to be part of the Contract.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices and rates stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect, in writing, of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be necessary for the Contractor to proceed with the Work. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.. **TIME IS OF THE ESSENCE** of all Milestone Dates, the Substantial Completion date and the Final Completion date in the accepted Construction Schedule, as such Schedule may be revised and approved by the Owner.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not commence the Work prior to receiving written notice to commence from the Owner or prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2.4 The Contractor shall proceed expeditiously in accordance with the construction schedule with adequate forces and shall achieve Substantial Completion within the Contract Time. The Contractor shall at all times ensure that each Subcontractor is providing and maintaining sufficient skilled workmen, materials and equipment to achieve Substantial Completion within the Contract Time. Absent Change Orders signed by the Owner or a delay for which the Contractor is entitled to an extension of time by § 8.3.1, the Contractor shall not make any claims for additional payment of straight time, overtime or premium time in undertaking to achieve Substantial Completion of the Work in accordance with the construction schedule. The burden of lost time and costs related to any Subcontractor's nonperformance shall not be charged to Owner.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine. Nothing in this Section 8.3.1 shall absolve the Architect of liability for delays due to the negligence of the Architect or its employees or consultants, or failure to comply with the agreement between the Owner and the Architect or the Contract Documents by the Architect or by the Architect's employees or consultants. Under no circumstances shall Owner be responsible or liable for any delay damages, including any *Eichleay* or other type of extended overhead or lost profit claims or damages, idle equipment costs, lost productivity or labor inefficiency costs, acceleration damages, suspension damages, consequential damages, incidental damages, or lost opportunity costs. Contractor acknowledges that it is aware of and considered this provision when submitting and pricing its Proposal and Contractor accepts the risk of delays.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15. Extensions of time shall be Contractor's sole remedy in the event of delays.

§ 8.3.3 Notwithstanding anything to the contrary in the Contract Documents, an extension of the Contract Time, to the extent permitted under Subparagraph 8.3.1, shall be the sole and exclusive remedy of the Contractor for any delay, hindrance, disruption, interference or obstruction to the Work (collectively referred to in this Subparagraph 8.3.3 as “Delays”). Except as provided in Section 6.2.6 of the Contract, in no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any Delay, including, without limitation, consequential damages, loss of efficiency or productivity costs, acceleration costs, lost opportunity costs, impact damages, extended overhead costs, or other similar remuneration.

§8.3.4 TIME IS OF THE ESSENCE in the completion of the Work by the Contractor.

§ 8.3.5 No extension of time, or increase in the Contract Sum, shall be granted because of seasonal variations in temperature, humidity or precipitation, which conditions, excepting force majeure, shall be wholly at the risk of the Contractor.

§ 8.3.6 The Contractor shall not be entitled to an adjustment of the Contract Time on account of delays: (i) that it could have avoided or mitigated using its best professional efforts; (ii) that do not impact the critical path; (iii) for which there is available float in the chain of activities affected by the delay; (iv) that were caused by or could have been reasonably anticipated by the Contractor or those for whom it is responsible; or (v) that could have been mitigated or avoided by the Contractor's timely notice to the Owner as required hereunder.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

The Contractor shall submit a schedule of values to the Architect within thirty (30) days of the first of the Contract Award or Preconstruction Meeting, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. **The description of the Work shall be sufficiently broken down to indicate labor and material costs associated with each area of Work. Any breakdown that fails to include sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work, will be rejected. The Schedule of Values shall be revised if later determined by the Owner or Architect to be inaccurate.** Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 Each application for payment shall be accompanied by the following, all in form and substance satisfactory to the Owner: (i) a duly executed Contractor's partial lien waiver; (ii) duly executed partial lien waivers from all Subcontractors and, when reasonably required, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and (iii) all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon

compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect solely to the Owner, based on the Architect's evaluation of the Work as provided in the Contract Documents and/or the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; or (3) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum. Notwithstanding anything herein to the contrary, issuance of a Certificate for Payment by the Architect is a recommendation only; payment to the Contractor of amounts certified in a Certificate for Payment is subject to the Owner's approval.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- .7 repeated failure to carry out the Work in accordance with the Contract Documents; or
- .8 failure to comply with or adhere to the requirements of the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15. The Owner shall not be deemed to be in default by reason of withholding payment while any of the above grounds remain uncured, nor shall any interest accrue or be payable with respect to any payments so withheld.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than five (5) days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. Notwithstanding anything in this Subparagraph 9.6.2 to the contrary, the Owner may elect, in the Owner's reasonable discretion, to make any payment requested by the Contractor on behalf of a Subcontractor or material supplier of any tier jointly payable to the Contractor and such Subcontractor or material supplier, or directly payable to such Subcontractor or material supplier. The Contractor and such Subcontractor or material supplier shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint payment be construed to create any (i) contract between the Owner and a subcontractor or material supplier of any tier, (ii) obligations from the Owner to such subcontractor or material supplier, or (iii) rights in such subcontractor or material supplier against the Owner. All such payments by the Owner shall be a pro tanto discharge of sums due the Contractor.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. The Owner may contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment or provide the Contractor with a written explanation for the reason for withholding such Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the properly submitted Application for Payment, or if the Owner does not pay the Contractor or provide the Contractor with a written explanation of the reason for withholding payment within seven days after the date established in the Contract Documents, the amount certified by the Architect or if the Owner does not so pay an amount awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing or an explanation of the reason for withholding such payments has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. As a condition precedent to Substantial Completion, the Contractor shall assemble and deliver to the Owner (1) all maintenance and operating manuals; (2) marked sets of field record drawings and specifications reflecting as-built conditions; (3) drawings reflecting the location of any concealed utilities, mechanical or electrical systems and components; (4) any special guaranties or warranties required by the Contract Documents; (5) all guaranties and warranties from Subcontractors, vendors, suppliers or manufacturers; (6) a list of the names, addresses and telephone numbers of all subcontractors and any other persons providing guarantees or warranties; (7) a permanent Certificate of Occupancy; (8) Operating permits for any mechanical equipment; and (9) any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use and occupancy of the Project.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Architect and the Owner in writing and shall prepare and submit to the Architect (1) a comprehensive list of items to be completed or corrected prior to final payment and (2) all Certificates of Occupancy and applicable permits required by the Contract Documents, endorsed by the Contractor and in a form reasonably acceptable to the Architect and Owner. Promptly after receiving such notice, the Architect will conduct a preliminary review to determine whether or not the Documents are generally complete and correct. If the Architect finds on the basis of this review that the Contractor's notice and supporting documents are not generally complete or correct, the Architect will return them to the Contractor for revision and resubmittal, describing in general the additions or corrections required. If the Architect finds on one preliminary review of the Contractor's resubmittal that the resubmitted notice and supporting documents are still not generally complete and correct, the Contractor shall again correct and resubmit them, and shall, in addition, reimburse the Owner for the cost of any change in the Architect's services resulting from such a second and any subsequent preliminary reviews. When the Architect finds on the basis of a preliminary review that the Contractor's notice and supporting documents are substantially complete, the Architect will proceed as stated in Section 9.8.3 below. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents. Owner shall be entitled to retain two hundred percent (200%) of the estimated cost of incomplete or unsatisfactory Work to reach Final Completion.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (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, (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 until at least 30 days' prior written notice has been given to the Owner, (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, (4) consent of surety, if any, to final payment and (5), statements in a form satisfactory to the Owner that in consideration of all prior payments and of final payment, the Contractor and its Subcontractors release and forever discharge the Owner from all mechanic's liens, claims, demands, obligations and liabilities of every kind arising out of or relating to the Contract or the Project other than those Claims specifically enumerated in the statement. 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 attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 INTENTIONALLY OMITTED

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by the Conditions and applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. Contractor acknowledges that public health, safety, and security are of the utmost importance in connection with its performance of the Work. Contractor shall, at all times, implement and maintain commercially reasonable safety, health, and security protocol with respect to its personnel on site, including implementing best practices as defined by the United States Centers for Disease Control and state and local public health agencies to avoid exposure to and protection against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) aka COVID-19. Contractor shall also take such actions as are necessary to protect the health, safety and security of the occupants and users of the subject property in connection with the Work and the Project, including adherence to guidelines promulgated by the State of Connecticut. »

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements thereon. Any damage to such property or improvements shall be promptly repaired by the Contractor at its sole cost and expense.

§ 10.2.4.1 When there are indications that the use of explosives or other hazardous material, equipment or unusual methods is necessary for execution of the Work, the Contractor shall give the Owner and Architect reasonable advance notice of the conditions.

§ 10.2.4.2 The Contractor shall be solely responsible for the handling, storage and use of explosive or other hazardous

materials when their use is permitted.

§ 10.2.4.3 The Contractor shall not bring explosives onto the site or use such in the Work without the prior written permission of the Architect and the Owner. For such use, the Contractor shall obtain necessary permits with copies to the Architect and the Owner. The Contractor shall furnish the Owner and Architect with certificates indicating proper and adequate insurance.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss to property referred to in subparagraphs 10.2.1.2, 10.2.1.3 and 10.2.1.4. If the damage or loss is due in whole or in part to the Contractor's failure to take the precautions required by this paragraph 10.2, the Contractor shall bear the cost. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 The Contractor shall at all times provide protection against weather (snow, rain, wind, storms or heat) so as to maintain all Work, materials, apparatus and fixtures free from damage. At the end of the day's work, all new Work likely to be damaged shall be reasonably protected against such weather.

§ 10.2.9 The Contractor shall provide adequate fire protection for all operations associated with the Work, and such protection must meet all applicable federal (including OSHA), State and municipal regulations.

§ 10.2.10 The Contractor shall remove and replace with new work at the Contractor's own expense, any Work damaged by failure to provide protection.

§ 10.2.11 The Contractor shall be responsible, to the extent not covered by insurance, for damage, loss, or liability due to theft or vandalism to the Work and stored materials when work is not in progress at night, on weekends or holidays.

§ 10.2.12 No visitors shall be allowed on the work site without prior written permission from the Owner.

§ 10.2.13 Cutting and welding to be performed in or immediately adjacent to existing spaces shall not be performed without written approval of the Owner for each instance.

§ 10.2.14 All employees at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work. The Contractor and all Subcontractors shall furnish documentation of successful completion of said course with the first certified payroll report for each employee. The Contractor shall indemnify and hold harmless the Owner from any and all fines, costs and expenses, including but not limited to reasonable attorney's fees, incurred by Owner due to the Contractor's violation of such Acts, standards and/or regulations. Such indemnity shall not be construed to limit the indemnity required under Subparagraph 3.18.1.

§ 10.2.15 The Contractor shall comply with the requirements of the Occupational Safety and Health Act and the Construction Safety Act of 1969, including all standards and regulations which have been promulgated by the governmental authorities which administer such Acts and said requirements, standards and regulations are incorporated herein by reference. The Contractor shall be directly responsible for compliance therewith on the part of its agents, employees, subcontractors, and material suppliers and shall directly receive and be responsible for all citations, assessments, fines, or penalties which may be incurred by reason of its agents, employees, material suppliers or subcontractors, to so comply.

§ 10.2.16 The Contractor shall at all times protect excavations, trenches, buildings, and materials from rainwater, ground water, ice, snow, back-up or leakage of sewers, drains, or other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping, and other equipment necessary to this end.

§ 10.2.17 MOLD GROWTH. The Contractor shall establish and maintain a program and safeguards to prevent growth of mold.

§10.2.18 Contractor and its Subcontractors shall not make news releases or publicize or issue advertising pertaining to the Work of this Agreement without first obtaining the written approval of the Owner.

§ 10.2.19 If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.20 The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner and the Architect.

§ 10.2.21 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.

§ 10.2.22 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

§ 10.2.23 The Contractor shall at all times protect excavations, trenches, buildings and materials, from rainwater, ground water, backup or leakage of sewers, drains and other piping, and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end.

§ 10.2.24 The Contractor shall remove snow and ice which might result in damage or delay to the Work.

§ 10.2.25 During the progress of the Work and at all times prior to the date of Substantial Completion or occupancy of the Work by the Owner, whichever is earlier, the Contractor shall provide temporary heat, ventilation, and enclosure, adequate to permit the Work to proceed in a timely fashion, and to prevent damage to completed Work or Work in progress, or to materials stored on the premises. The permanent heating and ventilation systems may be used for these purposes when available and appropriate, but the fuel cost shall be paid by the Owner.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents the Contractor shall immediately report the condition to the Owner and the Architect in writing and take reasonable precautions to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB). If such reasonable precautions will be inadequate to prevent foreseeable bodily injury and death, the Contractor shall immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. When the material or substance has been rendered harmless, any Work that has been stopped in the affected area shall resume. By Change Order, the Contract

Time shall be extended appropriately. appropriately. Termination of the Contract by the Owner due to the discovery of Hazardous Materials on the Project site shall be Termination for Cause. The term "rendered harmless" shall be interpreted to mean that levels of hazardous materials including, but not limited to asbestos and polychlorinated biphenyl, are less than any applicable exposure standards set forth in OSHA regulations. In no event, however, shall the Owner have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor or any materialman or supplier or any entity for whom any of them is responsible. The Contractor agrees not to use any fill or other materials to be incorporated into the Work which are hazardous, toxic or comprised of any items that are hazardous or toxic except to the extent provided in Section 10.3.7.

§ 10.3.3 The Contractor shall not be liable for pre-existing, environmental matters on, under or about the premises which constitute the Project, including without limitation, those relating to fines, orders, injunctions, penalties, damages, contribution, cost recovery compensation, losses or injuries resulting from the release or threatened release of hazardous materials, special wastes or other contaminates into the environment, the development or growth of mold within or on any structures, air quality levels, and to the generation, use, storage, transportation or illegal disposal of solid wastes, hazardous materials, special wastes or other contaminates. This disclaimer of liability shall apply to all such claims against the Contractor, whether direct or indirect, including without limitation, third party claims for which the Owner is seeking indemnification from the Contractor, excluding, however, any such claims that are caused by the negligence of the Contractor or subcontractor for which the Contractor is responsible.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence or intentional acts on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of properly performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.3.7 The Contractor will be solely responsible for compliance with laws and regulations governing the handling, storage, use or disposal of hazardous materials or wastes used, stored, generated, or disposed of in connection with construction of the Work, and shall obtain all permits and approvals, give all required notices, and observe all applicable procedures prescribed by the U.S. Environmental Protection Agency, the State of Connecticut and other governmental authorities having jurisdiction with respect to such activities. At Owner's request, Contractor shall furnish the Owner promptly with evidence satisfactory to Owner demonstrating the Contractor's compliance with such procedures, the giving of such notices, and the issuance of such permits and approvals, and shall indemnify Owner and hold Owner harmless with respect to any loss, damage or liability resulting from Contractor's failure to observe such procedures, give such notices, or obtain such permits and approvals. Contractor will be responsible for removal and disposal only of such "hazardous material" as is required to be removed by the Contract Documents or any such materials placed on the site by the Contractor or any party for which the Contractor is responsible.

§ 10.3.8 All material and equipment furnished under the Contract shall be free of asbestos and polychlorinated biphenyl (PCB). Any material or equipment containing these hazardous materials shall be considered defective and shall be removed by the Contractor at the Contractor's sole expense.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7. The Contractor shall promptly notify insurers as applicable, the Architect and the Owner of the nature of the emergency. Immediately thereafter, the Contractor shall submit to the Architect and the Owner a written report including a description of circumstances of the emergency and details of action taken.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies that are acceptable to the Owner and that are lawfully authorized to issue insurance in Connecticut. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

The insurance required shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and with respect to Contractor's completed operations coverages, as specified in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies that are acceptable to the Owner and that are lawfully authorized to issue surety bonds in Connecticut.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.1.5 The limits specified in the Contract Documents are minimum requirements and shall not be construed in any way as limits of liability or as constituting acceptance by the Owner of responsibility for losses in excess of such limits. The Contractor shall be responsible for all deductibles applicable to any insurance. No acceptance and/or approval of any insurance by Owner shall be construed as relieving or excusing Contractor from any liability or obligation imposed by the provisions of the Contract Documents.

§ 11.1.6 The Contractor shall not commence the Work under the Contract nor permit any Subcontractor to commence work on a subcontract until all the insurance required is obtained. The Contractor may carry, at its own expense, such additional coverage as it may deem necessary. The Contractor shall not be deemed to be relieved of any responsibility by the fact it carries insurance. Should the Contractor at any time neglect or refuse to provide the insurance required herein or should such insurance be cancelled or should the full annual aggregate or any policy not be available to satisfy the requirements of the Contract, the Owner shall have the right to procure such insurance and the cost thereof shall be deducted from monies then due or thereafter to become due the Contractor.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in Connecticut.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner does not intend to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner in good faith for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly and at its own expense correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. This obligation shall survive termination of the Contract under Paragraph 14 of the General Conditions. Nothing in this Section 12.2.1 shall absolve the Architect of its liability for failure to fulfill its obligations under the agreement between the Owner and the Architect.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2. Upon completion of any work under or pursuant to this Section 12.2, the one-year correction period in connection with the Work requiring correction shall be renewed and recommence.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.2.6 AUDITS

Upon request of the Owner or the Architect, the Contractor will cooperate, and secure the cooperation of all Subcontractors and Sub-subcontractors and assist the Owner and Architect during any audit of the Project conducted by the Owner at any time after Substantial Completion.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the State of Connecticut.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. The Contractor may not assign the Contract without the Owner's prior written consent, which consent the Owner may withhold in its absolute discretion. If the Contractor attempts to make an assignment without such consent, the Contractor shall nevertheless remain legally responsible for all of the Contractor's obligations under the Contract.

§ 13.2.2 Contractor shall execute all consents reasonably required to facilitate an assignment by the Owner.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law or in equity.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.3.3 No provision contained in the Contract Documents shall create or give to third parties any claim or right of action against the Owner or the Contractor except as specifically provided herein.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, certifications and approvals of portions of the Work shall be made as required by the Contract Documents and by the Conditions, applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3 and 13.4.4, shall be at the Owner's expense.

§ 13.4.3 If inspections and tests conducted under this Section 13.4 reveal failure in a portion of the Work, the Owner may order the inspection and testing, at the Contractor's expense, of any and all portions of the Work that are identical or similar to the failing portion.

§ 13.4.4 Required certificates of testing, certification, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.4.7 If any of the Work is required to be inspected or approved by any public authority, the Contractor shall cause such inspection or approval to be performed. No inspection performed or failed to be performed by the Owner hereunder shall be a waiver of any of the Contractor's obligations hereunder or be construed as an approval or acceptance of the work or any parts thereof.

§ 13.5 Interest

INTENTIONALLY OMITTED

§ 13.6 Wherever possible, each provision of this Agreement shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of this Agreement, or portion thereof, is prohibited by law or found invalid under any law, only such provision or portion thereof shall be ineffective, without in any manner invalidating or affecting the remaining provisions of this Agreement or valid portion of such provision, which are hereby deemed severable.

§ 13.7 The parties expressly understand and agree that any provision in this Contract related to job site safety, supervision, inspections or compliance with ordinances, laws, statutes, rules, regulations and/or protocols are solely for the benefit of the Contractor and Owner and do not create any rights, claims, or causes of action in third parties, separate contractors, Subcontractors or Sub-subcontractors, or any of their employees performing work on or at the Project. Nothing in this Agreement is intended to confer any rights in any other contractor, Subcontractor of any tier material supplier, or their employees, as there are no intended third party beneficiaries of this Agreement.

§ 13.8 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.

§ 13.9 If the Contractor is a "nonresident contractor" as defined in Section 12-430(7)(A) of the Connecticut General Statutes, as revised, the Contractor shall comply fully with the provisions of Section 12-430(7) and, prior to commencing the Work, shall furnish the Owner with a copy of the requisite certificate of compliance set forth in

subparagraph (E) of Section 12-430(7). Contractor agrees to indemnify Owner as to any and all taxes, interest and penalties that the State of Connecticut asserts are due with respect to the Contractor's activities.

§ 13.10 Contractor shall comply with the requirements of Connecticut General Statutes Section 31-52. Specifically, Contractor agrees that 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 months prior to the date hereof have been, residents of the labor market area, as established by the 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 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.

§ 13.11 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 Section 31-53 of the Connecticut General Statutes, 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 pay day.

§ 13.12 Contractor and each of its Subcontractors shall furnish proof that each employee performing the work of a mechanic, laborer or worker on the Project has completed a course of at least ten (10) hours in construction safety and health approved by the federal Occupational Safety and Health Administration (OSHA) or has completed a new miner training program approved by the Federal Mine Safety and Health Administration. Such proof shall be provided with the certified payroll submitted for the first week each such employee, mechanic, laborer, or worker, begins work on the Project.

§ 13.13 Contractor hereby confirms that it has complied with the obligations under the Immigration Reform and Control Act (IRCA) and that the workers provided under this Agreement are authorized for employment in the United States. Contractor further confirms that it has properly completed I-9's for all of its workers assigned to the Project and that it will require each of its Subcontractors to confirm that they have properly completed I-9's for all of their workers assigned to the Project. Contractor agrees to indemnify, defend, and hold harmless the Owner in the event that any of the workers assigned to the Project are found not to be authorized to work under the law or in the event that there is a determination that the obligations set forth under IRCA, including the obligation to correctly prepare and maintain I-9s, have not been complied with, including but not limited to all damages, fines and penalties, punitive damages, attorneys' fees and costs.

§ 13.14 Since the Contractor was required to be prequalified by the Connecticut Department of Administrative Services in the bidding for this Project, in the event the surety assumes the contract or obtains a bid or bids for completion of the contract, the surety 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.

§ 13.15 Each payment application shall be accompanied by a statement showing the status of all pending Change Orders, pending Change Directives and approved changes to the Contract. Such statement shall identify the pending Change Orders and pending Change Directives, and shall include the date such Change Orders and Change Directives were initiated, additional cost and/or time associated with their performance and a description of any work completed. The Contractor shall require each of its Subcontractors and suppliers to include a similar statement with each of their payment applications or invoices.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents and has not notified the Contractor of the reason for withholding payment.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon thirty (30) additional days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed. The notice of termination must state with specificity the means by which the Owner may cure its nonperformance, and the Contractor shall not terminate this Agreement if, within thirty (30) days of the notice, the Owner substantially undertakes such curative measures.

§ 14.1.4 INTENTIONALLY OMITTED

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may, without prejudice to any right or remedy available to the Owner under the Contract Documents or at law or in equity terminate the Contract if the Contractor:

- .1 institutes proceedings or consents to proceedings requesting relief or arrangement under the Federal Bankruptcy Act or any similar or applicable Federal or state law, or if a petition under any Federal or state bankruptcy or insolvency law is filed against the Contractor and such petition is not dismissed within sixty (60) days from the date of said filing, or if the Contractor admits in writing its inability to pay its debts generally as they become due, or if it makes a general assignment for the benefit of its creditors, or if a receiver, liquidator, trustee or assignee is appointed on account of bankruptcy or insolvency; or if a receiver of all or any substantial portion of the Contractor's properties is appointed;
- .2 abandons the Work; or if it fails, except in cases for which extension of time prosecute promptly and diligently the Work;
- .3 fails to supply enough properly skilled workers or proper materials for the Work;
- .4 submits an Application for Payment, sworn statement, waiver of lien, affidavit or document of any nature whatsoever which is intentionally falsified;
- .5 fails to make payment to Subcontractors for materials or labor in accordance with the Contract Documents and the respective agreements between the Contractor and the Subcontractors;
- .6 disregards the Conditions, applicable laws, statutes, ordinances, codes; rules and regulations, or lawful orders of a public and appropriate authority;
- .7 otherwise commits a substantial breach of a provision of the Contract Documents or
- .8 if a mechanic's or materialmen's lien or notice of lien is filed against any part of the Work or the site of the Project and not promptly bonded or insured over by the Contractor after the receipt of notice thereof in a manner reasonably satisfactory to the Owner.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and

- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.2.5 If the Owner terminates the Contractor for cause and it is thereafter determined that the Owner did not have the right to terminate the Contractor for cause, such termination for cause shall automatically be converted into a termination for convenience under Article 14.4 hereto.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the direct costs and time caused by suspension, delay, or interruption under Section 14.3.1. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 Upon such termination, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits and consequential damages. In no event shall Contractor claim or be entitled to payment of overhead or profit on Work not performed. The Owner shall be credited for (i) payments previously made to the Contractor for the terminated portion of the Work, (ii) claims that the Owner has against the Contractor under the Contract, and (iii) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract Sum

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

Failure to give such timely written notice will bar any claims by the Contractor. The Owner's prior written consent

to proceed with any Work for which the Contractor will claim it is entitled to additional compensation is a condition precedent to recovery for such work. Any notice of Claim must clearly identify the alleged cause and the nature of the Claim and include date and information then available to the claimant that will facilitate prompt verification and evaluation of the Claim.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Failure by the Contractor to give such notice within the time specified shall greatly prejudice the Owner, and the failure to submit proper and timely notice shall constitute a waiver and abandonment of such Claim.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Owner shall have no obligation to make payments to the Contractor on or against such claims, disputes, or other matters in question during the pendency of any mediation, arbitration, or other proceedings to resolve such matters. Owner shall continue to make payments of undisputed amounts.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. The Contractor shall have the burden of demonstrating the effect of the claimed delay on the Contract Time, and shall furnish the Owner and the Architect with such documentation relating thereto as the Owner and the Architect may reasonably require. In the case of a continuing delay, only one Claim is necessary. Any request seeking an extension of time contain:

- .1 a detailed description of the nature of each cause of delay, the date or dates upon which each cause of delay began and ended (as known or as projected), the number of days of delay attributable to each such cause, and the impact of such delay upon the construction schedule;
- .2 the construction schedule in effect at the start of the delay, showing that the portion of the Work that was, or will be, delayed is on the critical path and that no float remains or will be available for the delayed activities at the start of the delay;

- .3 a schedule analysis of the impact of the delay on the critical path in the construction schedule at the time of the delay, including any proposed adjustment to the Contract Time; and
- .4 such other supporting data that the Owner may request.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

INTENTIONALLY OMITTED

§ 15.1.6 LIQUIDATED DAMAGES

It is mutually agreed that if the Contractor fails to reach Substantial Completion of the Work by ten (10) months from the Owner's Notice to Proceed, the Owner will be damaged; and because the amount of the Owner's damages is difficult if not impossible to definitely ascertain and prove, it is hereby agreed that the amount of such damages shall be One Thousand Five Hundred Dollars (\$1,500) for each Day, or part thereof, of delay in substantially completing the Work. The Contractor agrees that said sum shall be deducted from monies due the Contractor under the Contract, or, if no money is due the Contractor, the Contractor hereby agrees to pay the Owner as liquidated damages, and not by way of penalty, such total sum as shall be due for such delay.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may demand or file for mediation of a Claim.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1. All claims, disputes and other matters in question between the Owner and the Contractor arising out of or related to the Contract or the breach thereof, except for claims which have been waived by the making and acceptance of final payments, shall be decided, at the sole option of the Owner, by one of the following dispute resolution procedures: (1) arbitration in accordance with rules agreed to by the Owner and the Contractor, (2) arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining, or (3) litigation.

§ 15.4.1.1 INTENTIONALLY OMITTED § 15.4.2 If a demand for arbitration is filed by the Contractor, the Owner will advise the Contractor within thirty days after the receipt of such a demand for arbitration if the Owner elects to arbitrate or rejects arbitration; such election, once made, shall be binding. The filing of a demand for arbitration by the Owner shall be deemed an election to arbitrate and shall constitute the exercise of the option of the Owner to proceed with arbitration. The Owner, but not the Contractor, may join or consolidate with any arbitration with the Contractor any disputes with the Architect, any Subcontractor, or any other party having an interest in the proceeding. This agreement to arbitrate shall be specifically enforceable under applicable law in any court having jurisdiction thereof. The award rendered by the arbitrator or arbitrators shall be final and judgment may be entered upon it in accordance with the applicable law in any court having jurisdiction thereof § 15.4.3 The Contractor agrees to continue performance of the Contract Work and shall proceed in accordance with the directives of the Owner, under protest, in the event of a dispute or controversy. Failure to so proceed shall constitute a material breach of the Contract, regardless of the ultimate decision on the dispute, it being understood and agreed that any controversy between the parties shall not be deemed a basis to delay or suspend the Contract Work, unless directed otherwise by the Owner.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 INTENTIONALLY OMITTED § 15.4.4.2 INTENTIONALLY OMITTED § 15.4.4.3. INTENTIONALLY OMITTED

Minimum Rates and Classifications
for Building Construction

ID#: 22-41237

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 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: 2223-10

Project Town: Cheshire

State#:

FAP#:

Project: HVAC Improvements at Cheshire High School

CLASSIFICATION	Hourly Rate	Benefits
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	44.57	31.79
2) Boilermaker	44.46	28.51
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	37.75	34.62 + a
3b) Tile Setter	37.1	30.52
3c) Tile and Stone Finishers	30.0	25.30
3d) Marble & Terrazzo Finishers	31.07	24.23
3e) Plasterer	41.9	28.75

-----LABORERS-----

4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	32.0	24.40
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	32.25	24.40
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	32.5	24.40
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.	33.0	24.40
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	32.75	24.40
4e) Group 6: Blasters, nuclear and toxic waste removal.	35.0	24.40
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	33.0	24.40
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	30.28	24.40
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	29.74	24.40
4i) Group 10: Traffic Control Signalman	18.0	24.40
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.	36.07	26.15

5a) Millwrights	36.32	26.81
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)	40.6	32.21+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	58.9	36.885+a+b
-----LINE CONSTRUCTION-----		
Groundman	26.5	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00
8) Glazier (Trade License required: FG-1,2)	40.78	23.40 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	39.7	38.77 + a
-----OPERATORS-----		
Group 1: Crane Handling or Erecting Structural Steel or Stone; Hoisting Engineer (2 drums or over). (Trade License Required)	50.27	26.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and Over	46.07	26.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	49.91	26.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	49.06	26.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer)	45.71	26.80 + a

As of: November 2, 2022

Group 3: Excavator; Gradall; 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 Finegrade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	44.86	26.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper); Goldhofer.	44.42	26.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Spreader, 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 mandrel).	43.73	26.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	43.73	26.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	43.38	26.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under mandrel).	42.99	26.80 + a
Group 8: Mechanic; Grease Truck Operator; Hydroblaster; Barrier Mover; Power Stone Spreader; Welding; Work Boat Under 26 ft.; Transfer Machine; Rigger Foreman.	42.54	26.80 + a
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); Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	42.04	26.80 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	39.7	26.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	39.7	26.80 + a

Group 12: Wellpoint Operator.	39.63	26.80 + a
Group 13: Compressor Battery Operator.	38.97	26.80 + a
Group 14: Elevator Operator; Tow Motor Operator (solid tire no rough terrain).	37.66	26.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	37.2	26.80 + a
Group 16: Maintenance Engineer.	36.46	26.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator; Portable Grout Plant Operator; Portable Water Filtration Plant Operator.	41.39	26.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (Minimum for any job requiring a CDL license); Rigger; Signalman.	38.61	26.80 + a
-----PAINTERS (Including Drywall Finishing)-----		
10a) Brush and Roller	37.22	23.40
10b) Taping Only/Drywall Finishing	37.97	23.40
10c) Paperhanger and Red Label	37.72	23.40
10e) Blast and Spray	40.22	23.40
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	47.03	34.05
12) Well Digger, Pile Testing Machine	37.26	24.05 + a

As of: November 2, 2022

13) Roofer (composition)	40.1	23.40
14) Roofer (slate & tile)	40.6	23.40
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	40.89	41.72
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)	47.03	34.05
-----TRUCK DRIVERS-----		
17a) 2 Axle, Helpers	31.16	28.78 + a
17b) 3 Axle, 2 Axle Ready Mix	31.27	28.78 + a
17c) 3 Axle Ready Mix	31.33	28.78 + a
17d) 4 Axle	31.39	28.78 + a
17e) 4 Axle Ready Mix	31.44	28.78 + a
17f) Heavy Duty Trailer (40 Tons and Over)	33.66	28.78 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	31.44	28.78 + a
17h) Heavy Duty Trailer up to 40 tons	32.39	28.78 + a

As of: November 2, 2022

17i) Snorkle Truck	31.54	28.78 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	47.55	28.96 + a
19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.

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

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

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. 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.

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)

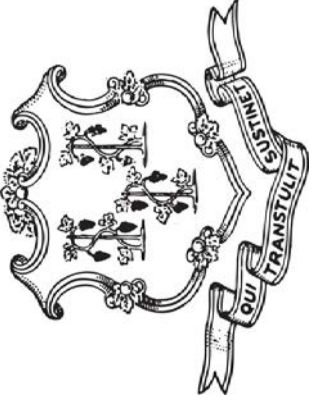
Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

--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: November 2, 2022

As of: November 2, 2022



THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

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

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

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

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

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

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

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

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

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

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

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

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

November 29, 2006

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

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

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

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

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

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

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

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

NOTICE

TO ALL CONTRACTING AGENCIES

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

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

Inquiries can be directed to 860.263.6790.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

Contracting Agency Certification Form

I, _____, acting in my official capacity as _____,
Authorized Representative Title

for _____, located at _____,
Contracting Agency Address

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

_____, located at _____,
Project name and number Address

shall be \$_____, which includes all work, regardless of whether such project
contains of one or more contracts.

Contractor Information

Name: _____

Address: _____

Authorized Representative: _____

Approximate Starting Date: _____

Approximate Completion Date: _____

Signature

Date

Return to:

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

Rate Schedule Issued (Date): _____

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): _____

[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.

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

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS
WEEKLY PAYROLL

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

*IF REQUIRED

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

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

Please specify the type of benefits provided:

- 1) Medical or hospital care _____ 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as

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

Section A:

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

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

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

(Signature)

(Title)

Submitted on (Date)

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

Weekly Payroll Certification For
Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Week-Ending Date:
Contractor or Subcontractor Business Name:

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE							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						FEDERAL STATE	FICA WITH- HOLDING	LIST OTHER						
				HOURS WORKED EACH DAY												WITH- HOLDING	WITH- HOLDING							
												1. \$ 2. \$ 3. \$ 4. \$ 5. \$ 6. \$												
												\$ Base Rate												
												\$ Cash Fringe												
												\$ Base Rate												
												\$ Cash Fringe												
												\$ Base Rate												
												\$ Cash Fringe												
												\$ Base Rate												
												\$ Cash Fringe												

*IF REQUIRED

[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 NUMBER		PERSON/WORKER, ADDRESS and SECTION		APPR RATE MALE/FEMALE AND RACE*	WORK CLASSIFICATION	DAY AND DATE							Total ST Hours	Total O/T Hours	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	WITH-HOLDING				WITH-HOLDING					
1		Week-Ending Date	PROJECT NAME & ADDRESS	TRADE LICENSE TYPE & NUMBER - OSHA	10 Certification Number	HOURS WORKED EACH DAY							S-TIME	O-TIME	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS HOURLY RATE	TOTAL FRINGE BENEFIT PLAN CASH	FEDERAL STATE	LIST OTHER	GROSS PAY AND NET PAY	
9/26/09	DOT 105-296, Route 82	S	M			T	W	TH	F	S	1.	2.									3.
Robert Craft 81 Maple Street Willimantic, CT 06226		M/C	Electrical Lineman E-1 1234567 Owner OSHA 123456			8	8	8	8	8	8	8	40		\$ 30.75 Base Rate	\$ 8.82 Cash Fringe			P-xxxx	\$1,582.80	#123 \$ xxx.xx
Ronald Jones 212 Elm Street Norwich, CT 06360		M/B	Electrical Apprentice OSHA 234567			8	8	8	8	8	8	40		\$ 19.99 Base Rate			xx.xx	G-xxx	\$1,464.80	#124 \$xxx.xx	
Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B		M/H	Project Manager			8						8		\$ Base Rate	\$ Cash Fringe	xx.xx	xx.xx	M-xxx	\$1,500.00	#125 xxx.xx	

OSHA 10 ~ ATTACH CARD TO 1ST CERTIFIED PAYROLL

44

***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 Blue Cross
- 2) Pension or retirement _____
- 3) Life Insurance Utopia
- 4) Disability _____
- 5) Vacation, holiday _____
- 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of 9/26/09

I, Robert Craft of XYZ Corporation, (hereafter known as Employer) in my capacity as Owner (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 employee 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 employee 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 employee of the Employer 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 employee's name first appears.

Robert Craft (Signature) owner (Title) 10/2/09 Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

Robert Craft (Signature) owner (Title) 10/2/09 Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

THIS IS A PUBLIC DOCUMENT
DO NOT INCLUDE SOCIAL SECURITY NUMBERS

Information Bulletin ***Occupational Classifications***

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

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

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

- **ASBESTOS WORKERS**

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

- **ASBESTOS INSULATOR**

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

- **BOILERMAKERS**

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

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

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

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

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

- **LABORER, CLEANING**

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

- **DELIVERY PERSONNEL**

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

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

- **ELECTRICIANS**

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

- **ELEVATOR CONSTRUCTORS**

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

- **FORK LIFT OPERATOR**

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

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

- **GLAZIERS**

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

- **IRONWORKERS**

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

- **INSULATOR**

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

- **LABORERS**

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

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

- **PAINTERS**

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

- **LEAD PAINT REMOVAL**

- Painter's Rate

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

- Laborer's Rate

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

- **PLUMBERS AND PIPEFITTERS**

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

- **POWER EQUIPMENT OPERATORS**

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

- **ROOFERS**

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

- **SHEETMETAL WORKERS**

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

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

****License required per Connecticut General Statutes: F-1,2,3,4.***

- **TILE MARBLE AND TERRAZZO FINISHERS**

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

- **TRUCK DRIVERS**

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

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

For example:

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

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

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

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

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

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

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

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

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

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

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

Ironworkers

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

Laborers (Tunnel Construction)

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

Roofers

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

Sprinkler Fitters

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

Truck Drivers

(Heavy and Highway Construction & Building Construction)

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

CHESHIRE PUBLIC SCHOOLS
TOWN OF CHESHIRE, CONNECTICUT

PROJECT SPECIFICATIONS FOR

HVAC IMPROVEMENTS AT CHESHIRE HIGH SCHOOL

525 South Main Street
Cheshire CT 06410

BID#2223-10

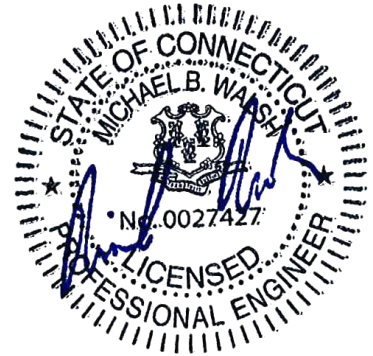


FEBRUARY 4, 2022

ENGINEER



Consulting Engineering Services
811 Middle Street
Middletown CT 06457
www.ceseng.com



ARCHITECT



Cheryl Newton Architects LLC
39 New London Tpke, Suite 320
Glastonbury, CT 06033
www.cnarchitectsllc.com

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END OF LIST

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Owner Furnished Items
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.
8. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: HVAC Improvements at Cheshire High School

1. Project Location: 525 South Main Street, Cheshire CT

B. Owner: Town of Cheshire, Cheshire Public Schools.

1. Owner's Project Representative: Daniel Bombero, Jr. Capital Projects Manager, Department of Public Works & Engineering Town of Cheshire (203)271-6650 office (203)271-6657 direct dbombero@chshirect.org
2. Owner's School Representative Richard Clavet, Facilities Manager, Cheshire Public Schools, 203-250-2576 rclavet@cheshire.k12.ct.us

C. Engineer: Consulting Engineering Services, 811 Middle Street, Middletown CT 06457

D. Engineer's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Architect: Cheryl Newton Architects LLC, 39 New London Tpke, Suite 320 Glastonbury CT 06033

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Removal of old unit ventilators and provide rooftop air handling units to improve indoor air quality in the classrooms though ventilation heating and cooling.
2. Installation of new rooftop mounted HVAC equipment, related ductwork, electrical power and controls.
3. Selective Demolition
4. Patching and repairing of acoustical panel ceilings, vinyl composition floor tiles, and any finishes disturbed by construction.
5. Removal of wall mounted aluminum louvers and infill of exterior masonry wall with stone veneer.
6. Patching and repair of EPDM roofing.
7. Joint Sealants

- B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.

- B. Owner-Furnished Products:

1. Acoustical Ceiling Panels and Tiles. Contractor to provide unit pricing if additional material is needed beyond the owners supply on-site.

1.6 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

- B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

- C. Use of Site: Limit use of Project site to areas within the Contract limits as indicated. Coordinate additional areas on site for storage of materials, dumpster locations and parking with the Owner Representatives. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits: Confine construction operations to areas within the Contract limits.

2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On

occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.

4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated.
 1. Weekend Hours: 7 a.m. to 5 p.m.
 2. Early Morning Hours: Comply with Town of Cheshire ordinances for restrictions on noisy work.
 3. Hours for Utility Shutdowns: Do not schedule utility shutdowns at times when school is in session.
 4. Second Shift work will only be permitted with prior authorization from the Owner.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than three business days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than three business days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building and on school property.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for background screening of Contractor personnel working on Project site.
 1. Maintain list of approved screened personnel with Owner's representative.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is **an amount incorporated in the Agreement, applicable during the duration of the Work** as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, **applicable taxes**, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No.1- 24x 24 Acoustical Ceiling Panels:

1. Description: Armstrong 1729A 24x24 Mineral Fiber Square Edge 5/8" Acoustic Ceiling Panel 0.55 NRC White.
2. Unit of Measurement: Materials and Installation of all required work to install 1 SF

B. Unit Price No. 2 - 24x 48 Acoustical Ceiling Panels:

1. Description: Armstrong 860 24x48 Mineral Fiber Square Edge 5/8" Acoustic Ceiling Panel 0.55 NRC White.
2. Unit of Measurement: Materials and Installation of all required work to install 1 SF

C. Unit Price No. 3 – 12 x12 Acoustical Ceiling Tiles:

1. Description: Armstrong 746 12x12 Mineral Fiber Beveled Edge 5/8" Acoustic Ceiling Tile 0.55 NRC White.
2. Unit of Measurement: Materials and Installation of all required work to install 1 SF

D. Unit Price No. 4 –Acoustical Panel Suspension System:

1. Description: Armstrong Prelude XL hot dipped galvanized metal 15/16" System, White
2. Accessories Included but Not Limited To: 12' Main Tee, 2' Cross Tee, 4' Cross Tee and 10' Wall Angle.
3. Unit of Measurement: Materials and Installation of all required work to install 1 SF

E. Unit Price No. 5 – Concealed Suspension System

1. Description: Armstrong Prelude XL hot dipped galvanized metal 15/16" System, White
2. Accessories Included but Not Limited To: Main Tee, Cross T, Wall Molding, Main Beam, 11" Breather Spines, 4' concealed tees, spring boarder clips, 4' access angle, 2' access hook
3. Unit of Measurement: Materials and Installation of all required work to install 1 SF

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Base Bid Plus Add Alternate 1.

1. Base Bid: Work related to installation of Rooftop Unit #2 serving Classrooms 43, 45, 47, 49, 51, 53, 55 and related mechanical, electrical, fire protection and architectural trades
2. Alternate: Work Related to installation of Rooftop Unit #1 serving Classrooms 88, 89, 90, 91, 92, 93 and related mechanical, electrical, fire protection and architectural trades

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use **CSI Form 13.1A**.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section.

Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from **ICC-ES**.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Engineer / Architect's Action: If necessary, Engineer / Architect will request additional information or documentation for evaluation within **seven** days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within **15** days of receipt of request, or **seven** days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Engineer/Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Engineer /Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than **15** days prior to time required for preparation and review of related submittals.
1. Conditions: Engineer / Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Engineer/ Architect will consider requests for substitution if received within 30 days after **the Notice of Award**. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Engineer / Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.

- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Engineer or Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on **AIA Document G710, Architect's Supplemental Instructions**.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer or **Architect** will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Engineer or **Architect** are not instructions either to stop work in progress or to execute the proposed change.
 - 2. **Within 20 days, when not otherwise specified**, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and

finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- e. Quotation Form: Use forms acceptable to Engineer and Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer or Architect.
1. Include a statement outlining 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 the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form acceptable to Engineer and Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Engineer or **Architect** will issue a Change Order for signatures of Owner and Contractor on **AIA Document G701**.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. **Construction** Change Directive: Engineer or **Architect** may issue a **Construction** Change Directive on **AIA Document G714** or Work Change Directive on **Construction** Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. **Construction** Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the **Construction** Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
 - 5. Section 018113.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.
 - 6. Section 018113.16 "Sustainable Design Requirements - LEED for Commercial Interiors" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.
 - 7. Section 018113.19 "Sustainable Design Requirements - LEED for Core and Shell Development" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.
 - 8. Section 018113.23 "Sustainable Design Requirements - LEED for Schools" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 2. Submit the schedule of values to Architect through Engineer at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of **AIA Document G703**
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.

- g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. 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 Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and/or Engineer and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 15th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in Project Manual.
- F. Application for Payment Forms: Use forms acceptable to Architect, Engineer and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.
- G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect and/or will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.

- b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- J. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.

10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
- M. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
 - 4. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Engineer, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within **15** days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in 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 ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Mechanical and Plumbing Work: Show the following:

- a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
6. Electrical Work: Show the following:
- a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
7. Fire-Protection System: Show the following:
- a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
8. Review: Engineer and/or Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
9. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."
10. Engineer and Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
- a. Engineer and Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in Autocad and PDF format.
 - c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner, Engineer and Architect.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Engineer and/or Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect and Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's and/or Engineer's Action: Architect and/or Engineer will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect and/or Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Engineer in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect and Engineer.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's and Engineer's response was received.
- F. On receipt of Architect's and/or Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Engineer within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Engineer, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner, Engineer and Architect, but no later than **15** days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Engineer and Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:

- a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Lines of communications.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Use of the premises and existing building.
 - l. Work restrictions.
 - m. Working hours.
 - n. Owner's occupancy requirements.
 - o. Responsibility for temporary facilities and controls.
 - p. Procedures for moisture and mold control.
 - q. Procedures for disruptions and shutdowns.
 - r. Construction waste management and recycling.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Engineer, and Owner's Commissioning Authority of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 3.
 - a. Submittals.
 - b. Possible conflicts.
 - c. Compatibility requirements.
 - d. Time schedules.
 - e. Weather limitations.
 - f. Manufacturer's written instructions.
 - g. Warranty requirements.
 - h. Temporary facilities and controls.
 - i. Installation procedures.
 - j. Coordination with other work.
 - k. Required performance results.
 - l. Protection of adjacent work.

4. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 5. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 6. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Engineer Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at biweekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Engineer and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to

do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
 - 1) Status of submittals.
 - 2) Deliveries.
 - 3) Off-site fabrication.
 - 4) Temporary facilities and controls.
 - 5) Progress cleaning.
 - 6) Quality and work standards.
 - 7) Status of correction of deficient items.
 - 8) Field observations.
 - 9) Status of RFIs.
 - 10) Status of proposal requests.
 - 11) Pending changes.
 - 12) Status of Change Orders.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
- B. Related Requirements:
 - 1. Section 011200 "Multiple Contract Summary" for preparing a combined Contractor's construction schedule.
 - 2. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 3. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file.
 - 2. Three paper copies of any sheets larger than 11x17.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- C. Construction Schedule Updating Reports: Submit with Applications for Payment.
- D. Daily Construction Reports: Submit at **weekly** intervals.
- E. Material Location Reports: Submit at **weekly** intervals.

1.4 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. **Time Frame:** Extend schedule from date established for **the Notice to Proceed** to date of **final completion**.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. **Activities:** Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. **Activity Duration:** Define activities so no activity is longer than **20**days, unless specifically allowed by Engineer or Architect.
 - 2. **Procurement Activities:** Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - a. Rooftop Unit RTU-1 and Rooftop Unit RTU-2.
 - 3. **Submittal Review Time:** Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. **Startup and Testing Time:** Include no fewer than 10 days for startup and testing.
 - 5. **Substantial Completion:** Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Engineer's administrative procedures necessary for certification of Substantial Completion.
 - 6. **Punch List and Final Completion:** Include not more than 30 days for completion of punch list items and final completion.
- C. **Constraints:** Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. **Products Ordered in Advance:** Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - 2. **Work Restrictions:** Show the effect of the following items on the schedule:

- a. Limitations of continued occupancies.
 - b. Uninterruptible services.
 - c. Partial occupancy before Substantial Completion.
 - d. Use of premises restrictions.
3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
- a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Deliveries.
 - g. Installation.
 - h. Tests and inspections.
 - i. Adjusting.
 - j. Startup and placement into final use and operation.
4. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
- a. Temporary enclosure and space conditioning.
 - b. Completion of mechanical installation.
 - c. Completion of electrical installation.
 - d. Substantial Completion.
5. **Other Constraints: Do not remove the existing unit ventilators until the new equipment is fully operational.**
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- G. Recovery Schedule: When periodic update indicates the Work is **14** or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working

hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within **seven** days of date established for **the Notice to Proceed**.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first **30** days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 15 days of date established for **the Notice to Proceed**. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Approximate count of personnel at Project site.
 - 3. Equipment at Project site.
 - 4. Material deliveries.
 - 5. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 6. Accidents.
 - 7. Meetings and significant decisions.
 - 8. Unusual events (see special reports).
 - 9. Stoppages, delays, shortages, and losses.
 - 10. Meter readings and similar recordings.
 - 11. Emergency procedures.
 - 12. Orders and requests of authorities having jurisdiction.
 - 13. Change Orders received and implemented.
 - 14. Construction Change Directives received and implemented.
 - 15. Services connected and disconnected.
 - 16. Equipment or system tests and startups.
 - 17. Partial completions and occupancies.
 - 18. Substantial Completions authorized.

- B. **Material Location Reports:** At **weekly** intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. **Site Condition Reports:** Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. **General:** Submit special reports directly to Owner within **one** day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. **Reporting Unusual Events:** When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. **Contractor's Construction Schedule Updating:** At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule two days before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- B. **Distribution:** Distribute copies of approved schedule to Architect[, **Construction Manager,**] Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules 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 performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. 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 revisions to submittals noted by Architect **and Engineer** plus additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup 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.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's and Engineer's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will **not** be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 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. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 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.

- a. Architect and Engineer reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's or 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.
1. Initial Review: Allow **15** days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect or Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow **15** days for review of each resubmittal.
- D. Paper Submittals: Will be accepted if electronic submittals are not available. Provide 5 copies of each paper submittal. All paper submittals must be accompanied by a transmittal, stamped by the contractor with date it was received, date it was reviewed and date it was mailed. Paper submittals will be noted on each page the submittal has been thoroughly reviewed by the Contractor prior to submitting for Architect and/or Engineer approval. The Engineer and Architect reserve the right to reject a paper submittal if it has not been thoroughly reviewed, or is missing pertinent information.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect and Engineer.
 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Engineer.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.
 - i. Submittal purpose and description.

- j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - l. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number, numbered consecutively.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- F. Options: Identify options requiring selection by Architect and/or Engineer.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and/or Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's and/or Engineer's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and/or Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Submit electronic submittals via email as PDF electronic files.
 - a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Notation of coordination requirements.
 - g. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
 - b. Three opaque (bond) copies of each submittal. Engineer will
 - c. will retain **two** copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit **two** full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, **through Engineer**, will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect and Engineer will retain **two** Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least **three** sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
 - G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
 - H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
 - I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
 - J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- U. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- V. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and 3 paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S AND ENGINEER'S ACTION

- A. Action Submittals: Architect and Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect and Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect and Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -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.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, Engineer, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Engineer.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. 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 requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data : For Contractor's quality-control personnel.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within **10** days of **Notice to Proceed**, and not less than **five** days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

- D. **Testing and Inspection:** In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. **Continuous Inspection of Workmanship:** Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. **Monitoring and Documentation:** Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. **Test and Inspection Reports:** Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. **Manufacturer's Technical Representative's Field Reports:** Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.

4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For 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, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where 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 the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to **ASTM E 329**; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

- a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. **Testing Agency Responsibilities:** Cooperate with Architect, Commissioning Authority, Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, Engineer's and Owner's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless 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.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association (The) www.aluminum.org	(703) 358-2960
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists www.aatcc.org	(919) 549-8141
ABAA	Air Barrier Association of America www.airbarrier.org	(866) 956-5888
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155
ACI	American Concrete Institute www.concrete.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216

AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AHRI	Air-Conditioning, Heating, and Refrigeration Institute, The www.ahrinet.org	(703) 524-8800
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts, Inc. www.aosaseed.com	(405) 780-7372
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000

ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)	
ASHRAE	American Society of Heating, Refrigerating and Air- Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (973) 882-1170
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9500
ATIS	Alliance for Telecommunications Industry Solutions www.atis.org	(202) 628-6380
AWCMA	American Window Covering Manufacturers Association (Now WCMA)	
AWCI	Association of the Wall and Ceiling Industry www.awci.org	(703) 534-8300
AWI	Architectural Woodwork Institute www.awinet.org	(571) 323-3636
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association) www.awpa.com	(205) 733-4077
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association	(212) 297-2122

	www.buildershardware.com	
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BICSI	BICSI, Inc. www.bicsi.org	(800) 242-7405 (813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org	(866) 342-4772
CCC	Carpet Cushion Council www.carpetcushion.org	(610) 527-3880
CDA	Copper Development Association www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca	(613) 230-9263
CEA	Consumer Electronics Association www.ce.org	(866) 858-1555 (703) 907-7600
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPA	Composite Panel Association www.pbmdf.com	(703) 724-1128
CRI	Carpet and Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176

CRRC	Cool Roof Rating Council www.coolroofs.org	(866) 465-2523 (510) 485-7175
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200 (800) 328-6306
CRRC	Cool Roof Rating Council www.coolroofs.org	(866) 465-2523 (510) 485-7175
CSA	Canadian Standards Association www.csa.ca	(800) 463-6727 (416) 747-4000
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(866) 797-4272 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
ECA	Electrical Components Association www.ec-central.org	(703)907-8024
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee http://content.asce.org/ejcdc/	(703) 295-6000
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association (Electrostatic Discharge Association) www.esda.org	(315) 339-6937
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)	(800) 967-5352

	www.intertek-etlsemko.com	
FIBA	Federation Internationale de Basketball (The International Basketball Federation) www.fiba.com	41 22 545 00 00
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation) www.fivb.ch	41 21 345 35 35
FM Approvals	FM Approvals LLC www.fmglobal.com	(781) 762-4300
FM Global	FM Global (Formerly: FMG - FM Global) www.fmglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarroof.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fsc.org	49 228 367 66 0
GA	Gypsum Association www.gypsum.org	(301) 277-8686
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GRI	(Part of GSI)	
GS	Green Seal www.greenseal.org	(202) 872-6400
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HI/GAMA	Hydronics Institute/Gas Appliance Manufacturers Association Division of Air-Conditioning, Heating, and Refrigeration Institute (AHRI) www.ahrinet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association	

(Part of NAAMM)

HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAPSC	International Association of Professional Security Consultants www.iapsc.org	(515) 282-8192
ICBO	International Conference of Building Officials www.iccsafe.org	(888) 422-7233
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
ICPA	International Cast Polymer Association www.icpa-hq.org	(703) 525-0320
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IES	Illuminating Engineering Society of North America www.iesna.org	(703) 525-0320
IEST	Institute of Environmental Sciences and Technology www.iest.org	(847) 255-1561
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISA	Instrumentation, Systems, and Automation Society, The www.isa.org	(919) 549-8411
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(877) 464-7732 (801) 341-7360
ITS	Intertek Testing Service NA	

(Now ETL SEMCO)

ITU	International Telecommunication Union www.itu.int/home	41 22 730 51 11
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LGSEA	Light Gauge Steel Engineers Association www.arcat.com	(202) 263-4488
LMA	Laminating Materials Association (Now part of CPA)	
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MCA	Metal Construction Association www.metalconstruction.org	(847) 375-4718
MFMA	Maple Flooring Manufacturers Association, Inc. www.maplefloor.org	(888) 480-9138
MFMA	Metal Framing Manufacturers Association, Inc. www.metalframingmfg.org	(312) 644-6610
MH	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937 (604) 298-7578
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(630) 942-6591
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(800) 797-6223 (281) 228-6200

NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAGWS	National Association for Girls and Women in Sport www.aahperd.org/nagws/	(800) 213-7193, ext. 453
NAIMA	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCAA	National Collegiate Athletic Association (The) www.ncaa.org	(317) 917-6222
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 222-2300
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(888) 300-6382 (269) 488-6382
NFHS	National Federation of State High School Associations www.nfhs.org	(317) 972-6900
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(866) 342-5642 (703) 442-4890

NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association) www.nofma.org	(901) 526-5016
NOMMA	National Ornamental & Miscellaneous Metals Association www.nomma.org	(888) 516-8585
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. (The) www.ntma.com	(800) 323-9736 (540) 751-0930
NWFA	National Wood Flooring Association www.nwfa.org	(800) 422-4556 (636) 519-9663
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute http://pgi-tp.cee.uiuc.edu	(217) 333-3929
PTI	Post-Tensioning Institute www.post-tensioning.org	(248) 848-3180
RCSC	Research Council on Structural Connections www.boltcouncil.org	
RFCI	Resilient Floor Covering Institute www.rfci.com	(706) 882-3833

RIS	Redwood Inspection Service www.redwoodinspection.com	(925) 935-1499
SAE	SAE International www.sae.org	(877) 606-7323 (724) 776-4841
SCAQMD	South Coast Air Quality Management District www.aqmd.com	(909) 396-2000
SCTE	Society of Cable Telecommunications Engineers www.scte.org	(800) 542-5040 (610) 363-6888
SDI	Steel Deck Institute www.sdi.org	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(877) 294-5424 (516) 294-5424
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)	
SIA	Security Industry Association www.siaonline.org	(866) 817-8888 (703) 683-2075
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPRI	Single Ply Roofing Industry www.spri.org	(781) 647-7026

SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWPA	Submersible Wastewater Pump Association www.swpa.org	(847) 681-1868
TCA	Tilt-Up Concrete Association www.tilt-up.org	(319) 895-6911
TCNA	Tile Council of North America, Inc. www.tileusa.com	(864) 646-8453
TEMA	Tubular Exchanger Manufacturers Association www.tema.org	(914) 332-0040
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(703) 683-1010
TPI	Turfgrass Producers International www.turfgrassod.org	(800) 405-8873 (847) 649-5555
TRI	Tile Roofing Institute www.tilerroofing.org	(312) 670-4177
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800
USGBC	U.S. Green Building Council	(800) 795-1747

	www.usgbc.org	
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association www.wcmanet.org	(212) 297-2122
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (312) 321-6802
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California) www.wicnet.org	(916) 372-9943
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 570-5441
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

DIN	Deutsches Institut fur Normung e.V. www.din.de	49 30 2601-0
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

COE	Army Corps of Engineers www.usace.army.mil	(202) 761-0011
CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
DOC	Department of Commerce www.commerce.gov	(202) 482-2000
DOD	Department of Defense http://dodssp.daps.dla.mil	(215) 697-6257
DOE	Department of Energy www.energy.gov	(202) 586-9220
EPA	Environmental Protection Agency www.epa.gov	(202) 272-0167
FAA	Federal Aviation Administration www.faa.gov	(866) 835-5322
FCC	Federal Communications Commission www.fcc.gov	(888) 225-5322
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(800) 488-3111
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-4000
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Buildings Service	

(See GSA)

PHS	Office of Public Health and Science http://www.hhs.gov/ophs/	(202) 690-7694
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board http://gulliver.trb.org	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USP	U.S. Pharmacopeia www.usp.org	(800) 227-8772
USPS	Postal Service www.usps.com	(202) 268-2000

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil/	(215) 697-2664

Available from Defense Standardization Program
www.dsp.dla.mil

Available from General Services Administration
www.gsa.gov

(202) 619-8925

Available from National Institute of Building Sciences
www.wbdg.org/ccb

(202) 289-7800

FTMS Federal Test Method Standard
 (See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards
 Available from Department of Defense Single Stock Point
<http://dodssp.daps.dla.mil>

(215) 697-2664

UFAS Uniform Federal Accessibility Standards
 Available from Access Board
www.access-board.gov

(800) 872-2253
(202) 272-0080

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs Bureau of Home
 Furnishings and Thermal Insulation
www.dca.ca.gov/bhfti

(800) 952-5210

(916) 574-2041

CCR California Code of Regulations
www.calregs.com

(916) 323-6815

CDHS California Department of Health Services
www.dhcs.ca.gov

(916) 445-4171

CDPH California Department of Public Health, Indoor Air Quality Section
www.cal-iaq.org

CPUC California Public Utilities Commission
www.cpuc.ca.gov

(415) 703-2782

TFS Texas Forest Service
 Forest Resource Development
<http://txforestservation.tamu.edu>

(979) 458-6606

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's Representatives, Architect, Engineer testing agencies, and authorities having jurisdiction.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Location of proposed air-filtration system discharge.
 4. Waste handling procedures.
 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of **8** at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 1. Identification Signs: Provide Project identification signs as indicated on Drawings.

2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.
- C. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- F.
- G. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- H. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control

procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

- E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- I. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
 - 2. Insulate partitions to control noise transmission to occupied areas.
 - 3. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 4. Protect air-handling equipment.
 - 5. Provide walk-off mats at each entrance through temporary partition.
- J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use permanent HVAC system to control humidity.
 - 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove

materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012300 "Alternates" for products selected under an alternate.
 - 2. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 3. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Engineer of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. **Manufacturer's Warranty:** Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner.

- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.

1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
2. **Specified Form:** When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

- C. **Submittal Time:** Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. **General Product Requirements:** Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
 - C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate

and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner and Engineer that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control

of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." and Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 024116 "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
 - 2. Section 024119 "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 3. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials whenever possible.
- B. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work.

1.5 INFORMATIONAL SUBMITTALS

- A. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until installation.

4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- C. Lighting Fixtures: Separate lamps by type and protect from breakage.
- D. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- D. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- E. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

- B. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- C. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- D. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- E. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- F. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for progress cleaning of Project site.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner's Representative. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's Engineer's and Owner's Representative's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.

5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements, including touchup painting.
 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect, Engineer and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect and Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A. or equivalent format.
1. Organize list of spaces in sequential order, starting from the rooftop and exterior wall repairs.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect and Engineer.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Engineer will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

- E. Warranty begins as of the date of substantial completion for the entire project unless noted otherwise by Architect, Engineer and Owner's Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.

- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
- 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Initial Manual Submittal: Submit draft copy of each manual at least **30** days before commencing demonstration and training. Engineer will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least **15** days before commencing demonstration and training. Engineer will return copy with comments.
1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within **15** days of receipt of Engineer's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Engineer.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

- a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent,

and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

- C. **Manufacturers' Maintenance Documentation:** Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.

- D. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.

- E. **Maintenance and Service Schedules:** Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. **Scheduled Maintenance and Service:** Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. **Maintenance and Service Record:** Include manufacturers' forms for recording maintenance.

- F. **Spare Parts List and Source Information:** Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

- G. **Maintenance Service Contracts:** Include copies of maintenance agreements with name and telephone number of service agent.

- H. **Warranties and Bonds:** Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. **Operation and Maintenance Documentation Directory:** Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 011200 "Multiple Contract Summary" for coordinating project record documents covering the Work of multiple contracts.
 - 2. Section 017300 "Execution" for final property survey.
 - 3. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 4. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and file prints.
 - 3) Submit record digital data files and one set(s) of plots.
 - 4) Architect and Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and 3 set(s) of prints.

- 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit annotated PDF electronic file of weekly written report indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.

- h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect, Engineer and Owner. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: DWG, Version 2020, Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Architect through Engineer for resolution.
 6. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013300 "Submittal Procedures" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect[**and Construction Manager**] for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, **record** Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's[**and Construction Manager's**] reference during normal working hours.

END OF SECTION 017839

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of the building where indicated in the Documents and as required for completion of other work.
2. Removal and salvage of existing building fixtures and equipment for reinstallation.
3. Patching and repair work indicated and as otherwise required to complete the work of this Section and other Sections.

B. Related Sections:

1. Section 042000 – Unit Masonry
2. Section 079200 – Joint Sealants
3. Section 078413 – Penetration Firestopping
4. Section 093000 – Resilient Tile Flooring
5. Section 095100 – Suspended Ceiling Systems
6. Section 099100 - Painting
7. Section 210040 – General Conditions for Fire Protection
8. Section 220040 – General Conditions for Plumbing
9. Section 230040 – General Conditions for Mechanical Section
10. Section 230090 – Digital Control System for HVAC
11. Section 230993 – Sequence of Operations for HVAC Controls
12. Section 240040 – General Conditions for Electrical

1.3 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be retained and protected in place, or reinstalled, salvaged, or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.
- C. Remove and Reinstall: Remove items indicated, clean, service and otherwise prepare them for reuse. Store and protect against damage. Reinstall items in the same locations or in the locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable protected storage location during selective demolition and then cleaned and reinstalled in their original location(s).

1.4 MATERIAL OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled or otherwise indicated to remain the Owner's property, demolished items shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
- B. Historical Items, relics and similar objects including, but not limited to cornerstones, commemorative plaques, antiques and other items if interest or value to the Owner, which may be encountered during selective demolition, remain the Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the Owner.

1.5 SUBMITTALS

- A. General: Submit each item in this article according to the General Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.
- B. Proposed Dust Control measures.
- C. Proposed noise control measures.
- D. Schedule of selective demolition activities indicating the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services.
 - 3. Coordination for shut off, capping and continuation of utility services.
 - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed work.
 - 5. Locations of temporary partitions and means of egress.
- E. Inventory of items to be removed and salvaged.
- F. Inventory of items to be removed by Owner.
- G. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction that might be construed as damage caused by selective demolition operations.
- H. Record drawings at Project Closeout according to Division 1 Section "Contract Closeout."
- I. Landfill records indicating receipt and acceptance of hazardous waste by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Requirements: Engage in an experienced firm that has successfully completed selective demolition Work similar to that indicated for this Project.

- B. Regulatory Requirements: Comply with the governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-demolition Conference: Conduct conference Project site to comply with pre-installation conference requirements of Division I Section "Project Meetings."

1.7 PROJECT CONDITIONS

- A. Owner may elect to occupy portions of the building immediately adjacent to selective demolition area(s). Conduct selective demolition so that Owner's operations will not be disrupted. Provide not less than 72 hours notice to Owner of activities that will affect Owner's operations.
- B. Owner assumes no responsibility for actual conditions of building(s) to be selectively demolished. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practical.
- C. Asbestos: It is not expected that asbestos will be encountered during the progress of the Work. If any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Owner.
- D. Storage or sale of removed items or materials on site will not be permitted.

1.8 SCHEDULING

- A. Arrange selective demolition schedule so as to not interfere with Owner's on-site operations.

1.9 WARRANTY

- A. Existing Special Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition by methods and with materials so as not to void existing warranties.

PART 2-PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. Where identical materials are not available or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine the extent of selective demolition required. Review Contract Documents fully and verify the nature and extent of required selective demolition work. Do not remove items, fixtures, equipment, finishes and other building components scheduled to remain.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
- E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to governing authorities.
 - 2. Provide not less than 72 hours notice to Owner if shutdown of service is required during changeover.
- B. Utility Requirements: Locate, identify, disconnect and seal or cap off indicated utility services serving building(s) to be selectively demolished. Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing and sealing or capping off utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.
 - 1. Coordinate required shut-off(s) with Owner's representative. Arrange to shut off indicated utilities with utility companies.
 - 2. Where utility services are required to be removed, relocated or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

- A. Drain, purge or otherwise remove, collect and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. Employ a certified, licensed exterminator to treat building and to control rodents and vermin before and during selective demolition operations.
- C. Conduct selective demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- D. Conduct selective demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition areas.
 - 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways where required by authorities having jurisdiction.
 - 2. Protect existing site improvements, and landscaping to remain.
 - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 - 4. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
 - 5. Protect walls, ceilings, floors and other existing finish work that are to remain and are exposed during selective demolition operations.
 - 6. Cover and protect furniture, furnishings and equipment that have not been removed.
- E. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
 - 1. Construct dustproof partitions of not less than nominal 4 inch studs, 5/8" gypsum wallboard with joints taped on occupied side and 1/2" fire retardant plywood on the demolition side.
 - 2. Insulate partitions to provide noise protection to occupied areas.
 - 3. Seal joints and perimeter. Equip partitions with dust proof doors and security locks.
 - 4. Protect air handling equipment.
 - 5. Weather-strip openings.
- F. Provide and maintain interior and exterior shoring, bracing or structural support to preserve the integrity, stability, and prevent movement, settlement or collapse. Strengthen or add new supports when required during selective demolition operations.

3.4 POLLUTION CONTROLS

- A. Use water, mist, temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
 - 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions such as ice, flooding and pollution.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level.
- D. Clean adjacent structures and improvements of dust, dirt, debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.5 SELECTIVE DEMOLITION

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
 - 2. Neatly cut openings and holes plumb, square and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed finish side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors or framing.

9. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
 10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations. Replace or restore items removed in error, coordinating repair work with other work indicated in the Documents.
- B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power driven masonry saw or hand tools: do not use power driven impact tools.
 - C. Break up and remove concrete slabs on grade unless otherwise shown to remain.
 - D. Remove resilient floor coverings and adhesive according to recommendations of the Resilient Floor Covering Institute's (RFCI) "Recommended Practices for the Removal of Resilient Floor Coverings" and addendum.
 1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.
 - E. Remove air conditioning equipment without releasing refrigerants.
 - F. Remove roofing systems down to existing roof deck. Remove no more existing roof than can be covered in one day with new roofing. See applicable Division 7 section for new roofing.
 - G. At end of Project work, remove construction fencing and temporary lighting, coordinating work with Owner's Representatives, completion schedules and required building access and security.
 - H. Salvage: Items to be removed, salvaged, stored on site and reinstalled within the Work, include but are not limited to the following:
 1. Acoustical Ceiling Panels
 2. Lighting Fixtures indicated for removal, storage and reinstallation
 3. Other existing building equipment, fixtures and improvements as may be identified by the Owner for Salvage.

3.6 PATCHING AND REPAIRING

- A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.
 1. **Unscheduled Demolition:** Assume responsibility for such additional patching, repairs, and replacement work required as a result of unscheduled demolition of existing materials, systems or finishes indicated to remain in the finished work. Provide required patching, repair or replacement work which is consistent with the standards of the Documents for similar work and which meets quality standards acceptable to the Architect.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to the manufacturer's written recommendations.
- C. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching, repairing and refinishing.
- D. Patch and repair floor and wall surfaces where demolished walls or partitions extend one finished area into another. Provide a flush and even surface of uniform color and appearance.
 1. Closely match texture and finish of existing adjacent surface.
 2. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 3. Where patching smooth painted surfaces, extend final paint coat over entire unbroken surface containing the patch after the surface has received primer and second coat.
 4. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 5. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.
- E. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.
- D. Recycling: Where practical and requested by the Owner, recycle materials in accordance with the Owner's written policy for recycling materials. Recycled materials may include, but are not limited to:
 1. Acoustic Ceiling Panels
 - A. Materials Acceptable for Recycling:
 1. All brands of dry, pulpable mineral fiber ceiling panels or tiles. All metal splines must be removed from tiles (24"x24").
 2. All brands of dry fiberglass panels (foil-back case by case). Facing must be easily removable.
 3. Any vinyl or scrim-faced mineral fiber panels.
 - B. Materials Not Acceptable for Recycling:

1. Asbestos containing ceiling tiles, Ceiling tiles installed below friable asbestos or contaminated with any other hazardous material.
 2. Red or pink-backed ceiling tiles.
 3. Wet, moldy or weathered ceiling tiles.
 4. Ceiling tiles or pallets/boxes which contain visible debris (garbage, construction waste).
 5. Ceiling tiles not packaged according to Armstrong Specifications.
- E. Coordinate recycling with the manufacturer of the product to be recycled.
1. Contact the Armstrong Ceiling Recycling Center at 1-877-276-7876 (option 4)

3.8 CLEANING

- A. Sweep the building broom clean on completion of selective demolition operations.
- B. Change filters on air handling equipment on completion of selective demolition operations.

END OF SECTION

SECTION 042000 - UNIT MASONRY

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. Concrete masonry units.
2. Stone.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.
9. Masonry-cell insulation.
10. Cavity-wall insulation.

B. Related Sections:

1. Section 024119 "Selective Demolition"
2. Section 079200 "Joint Sealants"
3. Section 099100 "Painting"

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
 - 3. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
 - 4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Verification: For each type and color of the following:
 - 1. Stone: 3 Samples of 24" x 24" showing variation of color, pattern, cleft and thickness

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include data on material properties and material test reports substantiating compliance with requirements.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include brand, type, and name of manufacturer.
 - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Reinforcing bars.
 - 6. Joint reinforcement.
 - 7. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
 - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination."
 - 1. Do **NOT** proceed with installation of masonry and stone veneer prior to on site conference with Contractor, Masonry Sub-Contractor, Architect and Owner's Representative.
 - 2. Failure to comply with Pre-installation Conference may require removal and reinstallation of masonry.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide square-edged units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent **for exposed** units.
1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) ACM Chemistries; RainBloc.
 - 2) BASF Aktiengesellschaft; Rheopel Plus.
 - 3) Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
- C. CMUs: ASTM C 90.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of **2800 psi (19.3 MPa)**
 2. Density Classification: **Normal weight**.
 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

2.3 STONE

- A. Slate: ASTM C 629.
1. Description: 1" Thick Natural Cleft Face Vermont Green, size indicated on drawings.
 2. Basis of Design: Sheldon Slate Products Company, Inc. 143 Fox Road, Middle Granville NY 12849 (518)642-1280 www.sheldonslate.com

2.4 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Provide aggregate for mortar and grout, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
- E. Colored Cement Product: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Products: Subject to compliance with requirements, provide one of the following Colored Portland Cement-Lime Mixes:
 - a. Capital Materials Corporation; "**Riverton Portland Cement Lime Custom Color**".
 - b. Holcim (US) Inc.; "**Rainbow Mortamix Custom Color Cement/Lime**".
 - c. Lafarge North America Inc.; "**Eaglebond Portland & Lime**".
 - d. Lehigh Cement Company; "**Lehigh Custom Color Portland/Lime Cement**".
 - 2. Formulate blend as required to produce color indicated or, if not indicated, as selected by Architect from manufacturer's standard colors.
 - 3. Pigments shall not exceed 10 percent of portland cement by weight.
- F. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Aggregate for Grout: ASTM C 404.
- H. Water: Potable.
- I. Masonry and Mortar Cements: The use of masonry cement and mortar cement will not be permitted.

2.5 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with eight subparagraphs below, unless otherwise indicated.
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.

3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M.
 4. Stainless Steel Sheet: ASTM A 666, Type 304.
- B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches (50 mm) parallel to face of veneer.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.
1. Where wythes do not align, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm).
 2. Wire: Fabricate from 3/16-inch-(4.8-mm-) diameter, hot-dip galvanized steel wire.
- D. Screw-Attached Masonry Veneer Anchors: Units consisting of wire tie section and metal anchor section complying with the following requirements:
1. Structural Performance Characteristics: Capable of withstanding a 100 lbf load in either tension or compression without deforming over, or developing play in excess of, 0.05 inch.
 2. Wire Ties: Rectangular-shaped wire tie pintles fabricated from 0.25-inch- (6.4- mm-) diameter, hot-dip galvanized steel wire. Pintles shall be flattened and serrated for superior bonding with mortar.
 3. Wire Tie Length: As required to extend 1-1/2 inches into masonry wythe of veneer face.
 4. Anchor Section: L-shaped sheet metal plate fabricate from minimum 0.1345-inch (3.4- mm) thick hot-dipped galvanized steel sheet, with holes top and bottom, and two horizontal legs with eyelets to allow wire tie pintle insertion with 2 inch maximum eccentricity, sized to accommodate insulation thickness indicated.
 5. Stainless-Steel Drill Screws for Steel Studs: Metal fastener as recommended by anchor manufacturer consisting of carbon-steel drill point and 300 Series stainless steel shank, complying with ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange with not less than three exposed threads.
 6. Basis-of-Design Product: "**HB-200 Adjustable Veneer Anchors**" by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product as manufactured by one of the following:
 - a. Dur-O-Wal Division.
 - b. Heckmann Building Products Inc.

2.6 MISCELLANEOUS ANCHORS

- A. Post-installed Anchors: Torque-controlled expansion anchors.
1. Load Capacity: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
 2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).

2.7 CAVITY-WALL INSULATION

- A. Basis-of-Design Product: Subject to compliance with requirements, provide **"STYROFOAM™ Brand CAVITYMATE™ Plus"** as manufactured by Dow Chemical Company or comparable product by one of the following:
1. DiversiFoam Products.
 2. Owens Corning.
 3. Pactiv Building Products Division.
- B. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, extruded closed-cell product with an integral skin.
1. Aged Thermal Resistance (R-value): 5.0 deg F x h x sq. ft./Btu at 75 deg F at 5 years for 1-inch (25-mm) thickness.
 2. Density: 25 psi (173 kPa).
 3. Flame-Spread and Smoke-Developed Indexes: 75 and 450, maximum, respectively.
- C. Adhesive: Type recommended by insulation board manufacturer for application indicated.
- D. Self-Adhering Construction Tape:
1. **"Bild-R-Tape"**, UC Industries, Inc.
 2. **"CCW-705"** self-adhering vapor/air barrier tape, Carlisle Coatings & Waterproofing.

2.8 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual, Division 7 Section "Sheet Metal Flashing and Trim" and as follows:
1. Stainless Steel sheet for architectural applications, meeting the requirements of ASTM A167, Type 304 or Type 316, with No. 4 Finish. Where stainless steel sheet gage is not indicated, provide 26 gage.
 2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Keystone Three Way Interlocking Thruwall Flashing; Keystone Flashing Co.
 3. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.6 m). Provide splice plates at joints of formed, smooth metal flashing.
 4. Fabricate through-wall flashing with hemmed edge, unless otherwise indicated. Fabricate with flashing extending flush to exterior face of mortar joint.
 5. Fabricate two-piece through-wall flashings as detailed where indicated.
- B. Flexible Flashing: For flashing not exposed to the exterior, use the following, unless otherwise indicated:
1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated

- polyethylene film to produce an overall thickness of not less than 0.040 inch (1.0 mm).
2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; "**Perm-A-Barrier Wall Flashing**".
 - b. Hohmann & Barnard, Inc.; "**Textroflash**".
 - c. Sandell Manufacturing Co., Inc.; "**Sando-Seal**".
 3. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
- C. Applications: Unless otherwise indicated, use the following:
1. Where flashing is indicated to receive counterflashing, use metal flashing.
 2. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with hemmed edge, unless otherwise indicated. Fabricate with flashing extending flush to exterior face of mortar joint.
 3. Where flashing is fully concealed, use flexible flashing.
- D. Solder and Sealants for Sheet Metal Flashings:
1. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
 2. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
 3. Solder for Zinc: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by manufacturer.
 4. Elastomeric Sealant: ASTM C 920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- 2.9 MISCELLANEOUS MASONRY ACCESSORIES
- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
 - B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 - C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
 - D. Weep/Vent Products: Use the following, unless otherwise indicated:

1. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm) long.
 2. Screen Insert: Stainless steel.
 3. Color: Gray.
 4. Basis-of-Design Product: "**#342S**" by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide the named product or comparable product by one of the following:
 - a. Advanced Building Products Inc.
 - b. Dayton Superior Corporation, Dur-O-Wal Division.
 - c. Heckmann Building Products Inc.
- E. Cavity Drainage Material: Free-draining mesh, made from recycled polymer strands that will not degrade within the wall cavity.
1. Configuration: Strips, full-depth of cavity and 10 inches (250 mm) wide, with dovetail shaped notches 7 inches (175 mm) deep that prevent mesh from being clogged with mortar droppings.
 2. Basis-of-Design Product: "**Mortar Net**"; Mortar Net USA, Ltd.

2.10 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Limit cementitious materials in mortar to portland cement and lime.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
1. For masonry below grade or in contact with earth, use Type M.
 2. For reinforced masonry, use Type S.
 3. For exterior, above-grade, non-load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to

ASTM C 143/C 143M.

2.11 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Diedrich Technologies, Inc.
 - 2. EaCo Chem, Inc.
 - 3. ProSoCo, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Matching Existing Masonry: Where indicated, match coursing, bonding, color, and texture of existing masonry.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install

cut units with cut surfaces and, where possible, cut edges concealed.

- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
 - 1. Mix units from several pallets or cubes as they are placed.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

- 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
- 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
- 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
- 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

- 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
- 2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
- 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).

4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Match existing adjacent bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches (100-mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
 5. Lay masonry units with 3/8-inch- (10-mm-) thick mortar joints, unless otherwise indicated.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
 1. Lay masonry units with 3/8-inch- (10-mm-) thick mortar joints, unless otherwise indicated.

- C. Set stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
 - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 - 2. Allow cleaned surfaces to dry before setting.
 - 3. Wet joint surfaces thoroughly before applying mortar.
 - 4. Provide bond-breaker strips between cast-stone masonry units and brick veneer units where indicated.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
- E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.
- F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 ANCHORING MASONRY VENEERS

- A. Wall Framing: Anchor masonry veneers to cold-formed metal framing (CFMF) with adjustable masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 - 2. Insert slip-in anchors in metal studs as sheathing is installed. Provide one anchor at each stud in each horizontal joint between sheathing boards.
 - 3. Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
 - 4. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 5. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 16 inches (406 mm) o.c. horizontally with not less than 1 anchor for each 1.77 sq. ft. of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.

3.7 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints in brick made from clay or shale as follows:
 - 1. Build in compressible joint fillers where indicated.
 - 2. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants."

3.8 LINTELS

- A. Install loose steel lintels where indicated.
- B. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.9 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows, unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At exterior masonry veneer and cold-formed metal framing back-up walls, extend flashing from exterior face of masonry veneer, through the veneer, across the air space behind the veneer, behind the rigid insulation and extend up over the face of sheathing a minimum of 8 inches (200 mm); with upper edge tucked under counterflashing strip specified in Division 07 Section "Fluid-Applied Membrane Air Barriers", lapping at least 4 inches (100 mm).
 - 3. At lintels, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
 - 4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Division 7 Section "Joint Sealants" for application indicated.
 - 5. Install metal drip edges with sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Division 7 Section "Joint Sealants" for application indicated.
 - 6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip edge.
 - 7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install weeps in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
 - 1. Space weeps formed from Cellular Plastic Weep/Vent 16 inches (400 mm) o.c.
 - 2. Place weeps at top of wall and below relieving angles to vent cavity
- D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Miscellaneous Masonry Accessories" Article.
 - 1. Use continuous cavity drainage material where cavity is less than 1 1/2".

- E. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:
 - 1. Payment for these services will be made by Owner.
 - 2. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.
- B. Testing Frequency: One set of tests for each 5000 sq. ft. (465 sq. m) of wall area or portion thereof.
- C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- D. Clay Masonry Unit Test: For each type of unit provided, per ASTM C 67.
- E. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- F. Prism Test: For each type of construction provided, per ASTM C 1314 at 28 days.

3.11 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry to comply with the following:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.

4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
8. Clean stone trim to comply with stone supplier's written instructions.
9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.12 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 075060 EPDM ROOF SYSTEM RESTORATION**PART 1 GENERAL****1.1 WORK INCLUDES****A. General Contractors:**

1. To provide restoration repairs on existing EPDM roofs, as shown on drawings and as specified herein.
2. To provide all accessories and appurtenances for a complete repair as shown and specified.

1.2 RELATED SECTIONS**A. Specified elsewhere:**

1. Section 01300 - Administrative Requirements.
2. Section 01780 - Closeout Submittals.

1.3 DEFINITIONS

- A. Roofing System Manufacturer:** The manufacturer whose system is indicated and whose products are specified under this section and who hereinafter is called "manufacturer."

1.4 QUALITY ASSURANCE**A. Qualifications and Requirements of the Roofing Contractor:**

1. Contractor shall be a firm approved by the Roofing System Manufacturer.

B. Requirements of Regulatory Agencies: Tests of standards by independent agencies whose classifications and requirements have general acceptance as regulatory.

1. ASTM: American Society for Testing and Materials.
2. FM: Factory Mutual Laboratories.
3. NFPA: National Fire Protection Association.
4. UL: Underwriters Laboratories, Inc.

C. Referenced Catalogs: Current as of the date of the bidding documents, and of the manufacturers specified who are incorporated herein by reference.

D. Application Qualifications:

1. Method shall be approved by the manufacturer of the selected roofing materials.
2. All products used in this renovation shall be from the same membrane manufacturer on the roof to be renovated.

1.5 SUBMITTALS

- A. Make all submittals in accordance with Section 013000.
- B. Roofing Firm Endorsement: At least three business days prior to first project coordination meeting, submit roofing firm's name, address, telephone number and manufacturer's endorsement of roofing firm to Architect.
- C. Submit written certification that the Roofing Contractor is an approved applicator of the manufacturer's products.
- D. Shop Drawings: Shall represent standards and details as specified herein or as indicated in the drawings. Manufacturer's standard shop drawings are NOT ACCEPTABLE.
 - 1. Minimum scale: 3" = 1'-0" unless otherwise specified.
 - 2. Required details: Sections and plan of each.
 - a. Roof drains
 - b. Roof curb
 - c. Plumbing vent
 - d. Lap seams
 - e. Base flashings
- E. Product Data: Material safety and technical information sheets for products being utilized.
 - 1. Mechanical Fasteners.
 - 2. EPDM Products:
 - a. 60 mils membrane.
 - b. Semi-cured self adhering cover strips 5", 6", 9", 12".
 - c. 3", 6", and 9" seam tape.
 - d. Aged membrane cleaner.
 - e. Bonding adhesive.
 - f. Splice adhesive.
 - g. Water cut off mastic.
 - h. SPM lap sealant.
 - i. Splice tape.
- F. Roof Membrane: EPDM- MATCH EXISTING - (45 mil, 60 mil)
- G. Samples: Roof Membrane and flashing – three pieces of manufacturer's sample.
 - 1. EPDM membrane.
 - 2. Semi-cured self-adhering cover strips.

1.6 PRE-INSTALLATION MEETING

- A. Convene one week before starting Work of this Section.
- B. The Foreman in charge of the crew performing restoration work must be in attendance.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver all materials in manufacturer's original, unopened containers and rolls with all labels intact and legible. All products shall bear Underwriters' Laboratories (UL) label.
- B. Deliver materials requiring fire resistance classification packaged with labels attached as required by label service.
- C. Deliver materials in sufficient time and quantity to all continuity of work and compliance with approved construction schedule.
- D. Handle rolled goods so as to prevent damage to edges and ends.
- E. Store all materials (outdoors) on clean raised platforms with weather-protective covering.
- F. Store rolled goods on end or as required by manufacturer.
- G. Provide continuous protection of the materials against any damage or deterioration with breathable coverings. Coverings such as canvas, visqueen or other non-breathable coverings will not be acceptable.
- H. Remove damaged or defective materials from site.
- I. Comply with all fire and safety regulations.
- J. Follow manufacturer's recommendations.
- K. All materials shall be new.
- L. All unprotected, moist, or otherwise damaged materials or products with evidence of moisture damage such as staining shall be removed permanently from the job.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements: Except as otherwise authorized by the Architect, following the manufacturer's written request for variance:
 - 1. It shall be the Contractor's responsibility to verify existing and forecasted weather conditions. If inclement weather is anticipated during the work period, Contractor shall take adequate precautions to ensure products applied to roofing and building interiors are protected from possible moisture damage or contamination.
 - 2. Wind velocity limitations shall be based on ability to remove existing roofing and apply the products in a specific manner. Special precautions may be necessary at times due to excessive winds experienced by this region.
 - 3. Special precautions will be required during application of new roofing products when ambient and/or wind chill temperatures are below 40 degrees F.
- B. Protection
 - 1. Avoid heavy traffic on completed work.
 - 2. Restore to original condition or replace work/materials damaged by any roofing operations.
 - 3. Protect paving, grass, and building walls adjacent to hoists and kettles, prior to starting.
 - a. Lap suitable protective materials at least 6 inches.

- b. Secure protective coverings against the wind.
 - c. Leave protective covering in place for duration of the roofing work.
 - d. Repair any damage to existing conditions caused by work of this Section.
 4. Provide protection of all neighboring and adjacent existing roof areas during construction. Repair and render watertight any damage to existing roof systems and flashing during demolition and new construction.
 5. Protect existing roof systems flashing and roofing projections to remain during renovation construction.
 - a. Flashing that was damaged during removal shall not be reinstalled.
 - b. Replace flashing of same material for damaged flashing at no additional cost to the Owner.
 6. Remove protection upon completion of the roofing work.
 7. Do not walk across repairs immediately after installation.
 8. Remove debris daily from roof and minimize dust, dirt, and noise with proper equipment.
 9. Contractor must take every precaution to prevent interior leakage, products from falling into interior, or other such occurrences.
 10. Contractor shall prevent access by the public to any materials, tools, or equipment during the course of the work. The Owner assumes no liability or responsibility whatsoever for any damage, theft, or other acts which occur to Contractor's material, products or equipment.
 11. Contractor shall return all improvements on or about the property which are shown to have been altered, removed, or otherwise changed to conditions which have existed previous to starting work or better.
 12. Existing conditions may not be shown on drawings. Some modification of details may be required to accomplish intent of documents. Modifications or adjustments shall be approved in advance by the Architect. Prior to work, the Contractor shall:
 - a. Ascertain to his satisfaction that all aspects of the specifications are workable as specified.
 - b. Become completely familiar with requirements and stipulations contained throughout all Contract Documents and specifications.
 - c. Verify existing site conditions with respect to, but not necessarily limited to, building accessibility, traffic/pedestrian flow, special safety considerations, all parked vehicles, attachment of the existing roofing/accessories, the building dimensions and roofing replacement impediment.
- C. Sequencing/Scheduling: At First Preconstruction Meeting
 1. Roofing Contractor:
 - a. Shall provide detailed schedule of all roofing operations
 - b. Ensure that the Project Foreman attends meeting.
 2. Subcontractors shall integrate their schedules for the "on-roof" operations.

1.9 WARRANTY

A. Contractor Guarantee:

1. Contractor shall guarantee the installation of the new roofing and flashing to be watertight for a period of 3 years from the Date of Substantial Completion.
2. Contractor shall make all repairs during this 3 year period to maintain a watertight roof in conformance with the specifications, at no additional cost to the Owner.
3. Contractor shall repair, at his own expense, all defects which are manifested as part of the Contractor's work within 3 years.
4. Contractor shall respond within 48 hours after notification of leakage to the roof site. If he does not, the Owner shall have the right, without invalidating this guarantee, to make any temporary repairs required, in order to protect the building and its contents from any damage due to the roof leakage. The cost of same will be billed to the Contractor.
5. Conversely, upon diligent response by the Contractor to repair a reported roof leak, if leaks are discovered that are due to faulty maintenance and/or operation of the building's equipment or accessories unrelated to the roof performance, then the Owner shall reimburse the Contractor the fair value of the Contractor's time and expenses incurred to respond to a false leak report, not to exceed \$100.00 for each occurrence.

B. Guarantee Period:

1. This period shall be established as commencing from the date that the Architect inspects the repairs and finds them to be in compliance with the contract documents and written approval of same is obtained from holder of the warranty.
2. Roofing Contractor shall notify the Architect in writing when the roof is complete for a final inspection.

C. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.1 EPDM MEMBRANE

- A. EPDM: (45 mil; 60 mil) Carlisle Syntec or Firestone Building Products.

2.2 ADHESIVE MATERIALS

- A. Surface Conditioner: Aged membrane cleaner manufactured by the roof membrane

manufacturer.

- B. Primer: As supplied by the roof membrane manufacturer.
- C. Membrane Adhesives: As supplied by the roof membrane manufacturer.
 - 1. 3", 6", 9" seam tape.
 - 1. Splice adhesive.
 - 2. Bonding adhesive.
- D. Insulation Adhesive: As supplied by the roof membrane manufacturer.

2.3 ACCESSORIES

- A. All accessories to be provided by roof membrane manufacturer.
- B. Perimeter Anchor Strips: Reinforced 60 mils EPDM 6 inches.
- C. Cover Strips: Semi-cured, self-adhering EPDM.
- D. SPM Lap Sealant.
- E. Water Cut-Off Mastic.
- F. Semi-Cured EPDM Flashing: 9", 12", and 18" widths.
- G. Nails: Ring shank stainless steel, 1-1/2" length.
- H. Preformed Boots: Flexible penetration boot with self-adhering flange.
- I. Termination Bars: 1/8" x 1" minimum.

PART 3 EXECUTION

3.1 EXISTING ROOFING

- A. Remove all existing roofing system materials as indicated in the drawings.
- B. Properly dispose of all roof debris to an off-site location.
- C. Protect surrounding areas from damage during new roof and general construction.
- D. At tie-in, do not remove more roofing than can be covered with new roofing by the end of each day's work, or prior to rain. Properly waterproof all areas prior to leaving the job site each day.
- E. Do not leave any roof deck open overnight or during rain. Water damage caused by this work shall be the responsibility of, and borne by, the Contractor. .

3.2 INSPECTION

- A. Verify that all work of subcontractors which penetrates the roof deck or requires men and equipment to transverse roof deck has been completed.
- B. Examine surfaces for inadequate anchorage, foreign material, moisture, unevenness or other conditions, which would prevent execution and quality of installation of a specified roofing and flashing system and accessory items.
 - 1. All surfaces shall be dry, smooth, and free of projections and holes that might rupture the membrane.
 - 2. Immediately before roof application, thoroughly clean surface of dust and loose material.
- C. Do not issue a proceed order to the subcontractor or proceed with any work until all defects are corrected to the satisfaction of, and with written approval by, the roofing system manufacturer.
- D. Inspect roof deck and roof edge conditions for defects or conditions that will affect the progress of roofing renovation.

3.3 EXISTING ROOF PREPARATION

- A. Prior to installing the new roofing tie-in, the Contractor shall inspect all existing rooftop conditions including, but not limited to, the roof deck, accessories, units, drainage, penetrations, etc. Contractor shall verify that the roof repairs may be installed in strict accordance with the original design, manufacturer's current recommendations, and other pertinent codes and regulations.
- B. Contractor shall protect surrounding areas from damage during the roof removal.
- C. Roofing materials shall not be applied when moisture in any form, such as dew, can be seen or felt on the surface to which the materials are to be applied.
- D. Contractor shall not leave any roof deck open overnight or during rain. Water damage caused by this work shall be borne by this Contractor.
- E. EPDM Roofing:
 - 1. Spray the existing EPDM membrane 18" out from the vertical plane and 9" to either side of lap seams with manufacturer's recommended cleaning solution. Rinse to remove all accumulated debris. Scrub with a brush or power wash membrane with a mixture of water and soap. Thoroughly rinse.
 - 2. Apply primer.

3.4 INSTALLATION

- A. Manufacturer's Instructions:
 - 1. Install roofing repairs with flashing systems and all accessory items in strict

accordance with the roof membrane system manufacturer's printed instructions current at date of bidding documents and as specified.

2. When items of conflict arise between the manufacturer's recommendations and the contract documents, the more stringent will govern, unless it violates the manufacturer's warranty requirements.

B. Field Lap Seam:

1. Inspect seam for open and debonded laps. Clean with aged membrane cleaner and install seam tape between EPDM sheets. Bond and roll with steel roller.
2. Following application of aged membrane cleaner and splice adhesive, install self-adhering, semi-cured EPDM cover strip centered on existing seam edge.
3. Roll entire seam with steel roller:
 - a. The salvaged adhesive edge of the cover strip shall be thoroughly rolled into place.
 - b. At cover strip laps and laps with other membranes, carefully roll along covered edge.
4. At the cover strip laps and laps with other membrane locations, install an uncured EPDM patch over the lap extending a minimum of 3 inches beyond the lap in all directions. All patch corners to be rounded.
5. Install a continuous bead of lap sealant over the edge of the cover strip and patches using an SPM lap sealant screed, tool lap sealant into and over the edge of the cover strip and patching membrane.

C. Base Flashing Condition – *Restoration*:

1. Following cleaning of the aged membrane, cut the existing membrane so that the cut edge is approximately 1" out from the existing roof curb when laid flat. Trim membrane at curb along debonded edge.
2. Install 9" reinforced EPDM self-adhering perimeter anchor strip using FM approved screws and stress plates. Insert the horizontal flange below existing membrane.
3. Remove release paper and bond existing and new membranes, rolls with steel roller to achieve positive bonding.
4. Wrap vertical conditions with 60 mils EPDM, fully adhered in splice adhesive. For curb conditions, remove HVAC unit and extend membrane up over top of curb. Nail off at 4" on center.
5. Install premolded, self-adhering EPDM corners in splice adhesive.
6. Install 6" semi-cured EPDM cover strip around base of conditions over lap of existing and new membrane on curb condition. Extend 9 inches beyond curb and 3 inches beyond underlying coverstrips.
7. Install a continuous bead of lap sealant over the edge of the cover strip and patches using an SPM lap sealant screed, tool lap sealant into and over the edge of the cover strip and patching membrane.
8. Refer to renovation details in drawings.

D. Base Flashing Conditions – *Renovation*:

1. Inspect base flashing conditions for debonded laps. Cut out membrane that can not be cleaned. Remove all foreign contaminates. Apply aged membrane cleaner and seam tape. Bond and roll to achieve full contact.
2. Wrap vertical conditions with 60 mils EPDM, fully adhered in splice adhesive. For curb conditions remove HVAC unit and extend membrane up over top of curb. Nail off at 4" on center.
3. Install premolded, self-adhering EPDM corners in splice adhesive.
4. Install 12" semi-cured EPDM cover strip around base of conditions over lap of existing and new membrane. On curb condition extend 9 inches beyond curb and 3 inches beyond underlying coverstrips.
5. Install a continuous bead of lap sealant over the edge of the cover strip and patches using an SPM lap sealant screed, tool lap sealant into and over the edge of the cover strip and patching membrane.
6. Refer to renovation detail in drawings.

E. Premolded Boot Conditions:

1. Examine the premolded boot. If free of deterioration, defects, damage, or deformations, proceed with renovations. If any of the above exists, refer to Section F. below.
2. Scrap and remove all loose sealant from atop premolded boot.
3. Remove old stainless steel pipe claims.
4. Wash top of boot and penetration with aged membrane cleaner.
5. Following washing of base of boot, apply aged membrane cleaner.
6. Install new water block between pipe and existing premolded boot.
7. Install new stainless steel clamp.
8. Apply a full bead of SPM lap sealant atop premolded boot.
9. At base condition, install 4" to 6" semi-cured, self-adhering EPDM cover strips in picture frame manner over horizontal flange of premolded boot. Extend a minimum of 3" beyond the underlying cover strip. Roll to assure positive bonding.

F. Premolded Boot – *Deteriorated* Conditions:

1. Remove stainless steel clamping ring, premolded boot, loose flashing on the vent pipe, sealant, and water cut-off mastic from vent pipe.
2. Install 3'-0" x 3'-0" target patch of 60 mils EPDM centered over vent pipe. Use 6" splice tape at edge and splice adhesive on interior.
3. Wrap pipe with semi-cured self-adhering EPDM.
4. Prime top of target patch. Install self-adhering premolded boot.
5. Install water block between inner side of premolded boot and vent pipe.
6. Install stainless steel pipe clamping ring and SPM sealant at top of premolded boot.

G. EPDM Field Sheet and Flashing Edges at Metal Conditions:

1. Scrape and remove all loose sealant.
2. Wash metal and adjacent EPDM membrane with manufacturer's recommended cleaning solution. Scrub and then thoroughly rinse.
3. Inspect condition and re-bond all loose and non-bonded conditions using seam tape. Clean thoroughly and wash with aged membrane prior to seam tape application.
4. Install splice adhesive to metal and adjacent EPDM.
5. Install a continuous bead of lap sealant over the edge of the membrane. Using an SPM lap sealant screed, tool lap sealant into and over the membrane edge and onto the metal.

3.5 ADJUST AND CLEAN

- A. Carefully inspect all completed work. Correct all defects.
- B. Clean up mastic spills and splatterings. Remove all surplus materials.
- C. Provide adequate protection of all completed work until Substantial Completion. Prevent traffic, storage or movement of any materials and/or equipment on the completed roofing systems.
- D. Remove all rubbish, debris, surplus materials, tools, and equipment from the job site.
- E. Provide 1/2" plywood walk boards on 1" insulation in areas of heavy traffic. Take any other measures to prevent damage to roofing system by any trade crew members.

END OF SECTION

SECTION 076200 METAL FLASHING

1 PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Roof flashings
- B. Counter flashings at roof mounted equipment and vent stacks

1.2 RELATED SECTIONS

- A. Division 02 “Selective Demolition”
- B. Division 04 “Unit Masonry”
- C. Division 07 “Joint Sealants”

1.3 REFERENCES

- A. Reference Standards: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

- 1. Federal Specification (FS) Publications:

- UU-B-790A-68 Building Paper, Vegetable Fiber

- 2. American Society for Testing and Materials (ASTM) Publications: B

- 32-04 Solder Metal

- B 370-03 Copper Sheet and Strip for Building Construction

- D 41-05 Asphalt Primer Used in Roofing, Dampproofing and Waterproofing

- D 2822-05 Asphalt Roof Cement

- D 5643-94 Coal Tar Roof Cement, Asbestos Free

- 3. Sheet Metal and Air Conditioning Contractors National Association, Incorporated (SMACNA) Publication:

- 2003 Architectural Sheet Metal Manual

1.4 SUBMITTALS

- A. Samples:

- 1. Sheet Metal Materials: Two (2) pieces, 6 by 10 inches, of each type.

2. Caps and Reglets: One (1) piece, 6 inches long, and one (1) sample.
 3. Nails and Other Fastenings: Two (2) each.
- B. Shop Drawings: Indicate thicknesses, dimensions, fastenings and anchoring methods and other provisions necessary for thermal expansion and contraction. Scaled catalog cuts may be submitted for factory fabricated items.
1. Base and cap flashing (counter flashing).
 2. Flashing at roof penetrations.
 3. Reglets and termination bars.
- C. Certificates of Compliance: Manufacturer's certificates attesting that materials meet specified requirements.
- 1.5 DELIVERY, HANDLING AND STORAGE: Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness and wet storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like new condition. Handle sheet metal items to avoid damage to surfaces, edges and ends. Store materials in dry, weather tight, ventilated areas until immediately before installation.
- 1.6 GUARANTEE
- A. Guarantee all work against defects in materials and workmanship for three (3) years following substantial completion.
1. Provide duplicate original guarantees in writing on Contractor's letterhead.

2 PART 2 – PRODUCTS

2.1 MATERIALS

- A. Furnish sheet metal items in 8 to 10 foot lengths. Single pieces less than 8 feet long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Provide accessories and other items essential to complete the sheet metal installation. These accessories shall be made of the same materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gauge, thickness or weight specified. Sheet metal items shall have manufacturer's durinodic coating finish unless specified otherwise.
- B. Exposed Sheet Metal Items: Shall be of the same material. The following items shall be considered as exposed sheet metal: gravel stops, fascia and caps; base,

eave and stepped flashings; reglets, scuppers and accessories.

- C. Exposed Flashings: ASTM B 370, Type 1, cold rolled; 20 oz/sq ft, natural finish with zinc-tin alloy coating to yield a total weight no less than 21 oz/sq ft.
 - 1. Approved manufacturers:
 - a. Revere Copper Products, Inc., Rome, NY (800.448.1776)
 - b. Architectural Products by Outwater LLC, Wood-Ridge, NJ (800.631.8375)
 - c. Cheney Flashing Company, Trenton, NJ (800.322.2873)
- D. Reglets: Recessed; 0.032 inch cold rolled copper, formed as indicated in NRCA and SMACNA manuals, where indicated on the construction documents.
- E. Bituminous Plastic Cement: ASTM D 2822, Type I; ASTM D 5643.
- F. Building Paper: FS UU-B-790, Style 4, Grade B.
- G. Asphalt Primer: ASTM D 41.
- H. Fastener: Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials.
- I. Solder: ANSI/ASTM B 32; 50/50 type.
- J. Flux: FS A-A-51145D.

3 PART 3 – EXECUTION

3.1 INSTALLATION

- A. Requirements: Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications, conform to the applicable requirements of the SMACNA Architectural Sheet Metal Manual. Join sheet metal together as recommended by the manufacturer or by the SMACNA manual.
- B. Workmanship: Make lines, arises and angles sharp and true. Free exposed surfaces from visible wave, warp and buckle and tool marks. Fold back exposed edges neatly to form a ½ inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction

- C. Nailing: Confine nailing of sheet metal generally to sheet metal having a maximum width of 18 inches. Confine nailing or flashing to one edge only. Space nails evenly not over 3 inches on centers and approximately ½ inch from edge unless otherwise specified or indicated. Face nailing will not be permitted. Where sheet metal is applied to other than wood surfaces, include in shop drawings, the locations for sleepers and nailing strips required to secure the work.
- D. Cleats: Provide cleats for sheet metal 18 inches and over in width. Space cleats evenly not over 12 inches on centers unless otherwise specified or indicated. Unless otherwise specified, cleats shall be not less than 2 inches wide by 3 inches long and of the same material and thickness as the sheet metal being installed. Secure one end of the cleat with two nails and the cleat folded back over the nail heads. Lock the other end into the seam. Pre-tin cleats for soldered seams.
- E. Bolts, Rivets and Screws: Install bolts, rivets and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection.
- F. Flat-Lock Seams: Finish not less than ¾ inch wide.
- G. Lap Seams: Finish soldered seams not less than 1-inch wide. Overlap seams not soldered, not less than 3 inches.
- H. Loose-Lock Expansion Seams: Not less than 3 inches wide; provide minimum one inch movement within the joint. Completely fill the joints with the specified sealant, applied at not less than 1/8 inch thick bed. Sealants are specified in Section 07900 – Sealants.
- I. Protection from Contact with Dissimilar Materials:
1. Metal Surfaces: Paint surfaces in contact with mortar, concrete or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
 2. Wood or Other Absorptive Materials: Paint surfaces that may become repeatedly wet and in contact with metal with two (2) coats of aluminum paint or a coat of heavy-bodied bituminous paint.
- J. Expansion and Contraction: Provide expansion and contraction joints at not more than 40 foot intervals. Where the distance between the last expansion joint and the end of the continuous run is more than half the required interval, an additional joint shall be provided. Space joints evenly.
- K. Base Flashing: Extend up vertical surfaces of the flashing not less than 8 inches and not less than 4 inches under the roof covering. Where finish wall coverings form a counter flashing, extend the vertical leg of the flashing up behind the applied wall covering not less than 6 inches. Overlap the flashing strips with the

previously laid flashing not less than 3 inches. Fasten the strips at their upper edge to the deck, with compatible, large head roofing nails. Install and fit the flashings so as to be completely weather-tight. Base flashing for interior and exterior corners shall be factory fabricated.

- L. Counter Flashing: Except where indicated or specified otherwise, insert counter flashing in new cut-out reglets located from 9 to 10 inches above the new roof deck in the existing masonry walls, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches. Fold the exposed edges of counter flashings $\frac{1}{2}$ inch. Where stepped counter flashings are required, they may be installed in short lengths or may be of the preformed one piece type. Provide end laps in counter flashings not less than 3 inches and make it weather-tight with plastic cement. Do not make lengths of metal counter flashings exceed 10 feet. Form the flashings to the required shapes before installation. Factory form the corners not less than 12 inches from the angle. Secure the flashings in the reglets with lead wedges and space not more than 18 inches apart; on short runs, place wedges closer together. Fill caulked type reglets or raked joints which receive counter flashing with caulking compound. Caulking is covered in Section 07900 – Sealants. Turn up the concealed edge of counter flashings built into masonry or concrete walls not less than $\frac{1}{4}$ inch and extend not less than 2 inches into the walls. Install counter flashing to provide a spring action against base flashing.
- M. Flashing at Roof Penetrations and Equipment Supports: Provide metal flashing for all pipes, ducts and conduits projecting through the roof surface and for equipment supports, guy wire anchors and similar items supported by or attached to the roof deck. Provide new or salvage existing rain hoods, ventilator shields, etc.
1. Single Pipe Vents: Set flange of sleeve in cement and nail 3 inches on centers. Bend the top of sleeve over and extend down into the vent pipe a minimum of 2 inches. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two piece formed metal housing. Set metal housing with a metal sleeve having a 4 inch roof flange in bituminous plastic cement and nailed 3 inches on centers. Extend sleeve a minimum of 8 inches above the roof deck and lapped a minimum of 3 inches by a metal hood secured to the vent pipe by a draw band. Seal the area of hood in contact with vent pipe with an approved sealant. Sealants are covered under Section 07900 – Sealants.
- N. Counter Flashing: End counter flashing at termination bars as indicated on Drawings. Seal termination bar with sealant as specified in Section 07900 – Sealants.

3.2 PAINTING: Field-paint sheet metal for separation of dissimilar materials.

3.3 CLEANING

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks and solder or weld marks.

3.4 REPAIRS TO FINISH

- A. Scratches, abrasions and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes and variations of color and surface texture. Replace items which cannot be repaired.

3.5 FIELD QUALITY CONTROL

- A. Establish and maintain a quality control procedure for sheet metal used in conjunction with roofing to assure compliance of the installed sheet metalwork with the contract requirements. Work not in compliance with the contract shall be promptly removed and replaced or corrected. Quality control shall include, but not be limited to, the following:
1. Observation of environmental conditions; number and skill level of sheet metal workers; condition of substrate.
 2. Verification of compliance before, during and after installation. Inspection of sheet metalwork, for proper size and thickness, fastening and joining and proper installation.
- B. Procedure: Submit for approval prior to start of roofing work. Include a checklist of points to be observed. Document the actual quality control observations and inspections.

END OF SECTION

SECTION 078413 PENETRATION FIRESTOPPING

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. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in smoke barriers.
 - 3. Sealant joints in fire-resistance-rated construction.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.7 PROJECT CONDITIONS

- A. **Environmental Limitations:** Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **Fire-Test-Response Characteristics:**
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."
 - 3) FM Global in its "Building Materials Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. **Penetration Firestopping Systems:** Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg (74.7 Pa).
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at and no more than 50-cfm (0.024-cu. m/s) cumulative total for any 100 sq. ft. (9.3 sq. m) at both ambient and elevated temperatures.
- D. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E 84.
- E. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content:
 - 1. Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- F. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- G. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Intumescent Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.

- D. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- E. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- F. Products: Subject to compliance with requirements, provide products from the following manufacturers:
 - 1. The Rectorseal Corporation
 - 2. 3M Fire Protection Products
 - 3. Hilti Construction Chemicals, Inc.
 - 4. Grace Construction Products

2.4 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than **3 inches (76 mm)** high and with minimum **0.375-inch (9.5-mm)** strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at **15 feet (4.57 m)** from end of wall and at intervals not exceeding **30 feet (9.14 m)**.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within **6 inches (150 mm)** of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.

- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. Penetration Firestopping Systems, CMU walls – 1 and 2 hour ratings – Comply with the following:
 - 1. Metallic Pipe or Conduit 8 inches max. diameter: UL Classified Systems **C-A3-1031**
 - 2. Non-Metallic Pipe or Conduit 5 inches max. diameter: UL Classified Systems **W-J-2012**
 - 3. Electric Cables, 256 sq. in. max opening, 16 inch max dimension: UL Classified Systems **W-J-3003**
 - 4. Duct, 640 sq. in. max. opening: UL Classified Systems **C-AJ-7009**
 - 5. Duct, 2700 sq. in. max. opening: UL Classified Systems **C-AJ-7022**
- C. Penetration Firestopping Systems Gypsum Wallboard Partitions– 1 and 2 hour ratings – Comply with the following:
 - 1. Metallic Pipe or Conduit: UL Classified Systems **W-L-1082**
 - 2. Non-Metallic Pipe or Conduit: UL Classified Systems **W-L-2014**
 - 3. Electric Cables: UL Classified Systems **W-L-3003**
 - 4. Duct: UL Classified Systems **C-AJ-7002**

END OF SECTION 07 84 13

SECTION 079200 JOINT SEALANTS

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. Exterior Joints in the following vertical surfaces and non traffic horizontal surfaces:
 - a. Control and Expansion Joints in unit masonry, precast architectural concrete and walkways.
 - b. Joints between different materials to prevent infiltration of weather elements.
 - c. Perimeter joints between frames (of doors and windows) and masonry.
 - d. Control and Expansion Joints in ceilings and overhead structures.
 - e. Other joints indicated or otherwise requiring sealants to complete the work.
- 2. Interior Joints in the following vertical surfaces and horizontal non-traffic surfaces:
 - a. Control and Expansion Joints on exposed surfaces of interior walls.
 - b. Perimeter joints of exterior openings.
 - c. Perimeter joints between interior wall surfaces and frames (of doors and windows) and masonry.
 - d. Joints at perimeter of acoustically rated gypsum wall board partitions.
 - e. Other joints indicated or otherwise requiring sealants to complete the work.

B. Related Sections:

- 1. Division 02 "Selective Demolition" for removal of existing joint sealants
- 2. Division 04 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
- 3. Division 22 "Plumbing Work"
- 4. Division 23 "HVAC Work"
- 5. Division 26 "Electrical Work"

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water resistant continuous joint seals without staining or deteriorating joint substrates.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Field-Adhesion Test Reports: For each sealant application tested.
- G. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- D. Preinstallation Conference: Conduct conference at **Project site**.

1.7 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below **40 deg F (5 deg C)**.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Ten years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Colors of Exposed Joint Sealants: **As selected by Architect from manufacturer's full range.**

2.2 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
 - 1. Products: Subject to compliance with requirements, **provide the following**:
 - a. Pecora Corporation; **890NST**

2.3 URETHANE JOINT SEALANTS

- A. High Performance, Multi-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Uses T and I.
 - 1. Products: Subject to compliance with requirements, **provide the following**:
 - a. Tremco Incorporated; THC900/901

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Products: Subject to compliance with requirements, **provide the following**:
 - a. Tremco Incorporated; Tremflex 834.

2.5 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, **Type O (open-cell material)** and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

- a. Metal.
- b. Glass.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

I. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage

or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces **JS-1**.
1. Joint Locations:
 - a. Control and expansion joints in brick pavers.
 - b. Isolation and contraction joints in cast-in-place concrete slabs.
 - c. Joints between plant-precaster architectural concrete paving units.
 - d. Joints between different materials listed above.
 - e. Other joints as indicated.
 2. Urethane Joint Sealant: High performance multi component, pourable, traffic grade
 3. Joint Sealant: Tremco THC-900/901
 4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces **JS-2**.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precaster architectural concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors and windows
 - f. Other joints as indicated.
 2. Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 100/50
 3. Joint Sealant: Pecora 890 NST
 4. Joint-Sealant Color As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces **JS-3**.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of **interior unit masonry, concrete, walls and partitions**.
 - e. Perimeter joints between interior wall surfaces and frames of **interior doors and windows**.
 - f. Other joints as indicated.
 2. Joint Sealant: **Latex**
 3. Joint-Sealant Color: **As selected by Architect from manufacturer's full range of colors.**

END OF SECTION 079200

SECTION 095100 SUSPENDED CEILING SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes:

1. Acoustical ceiling panels.
2. Exposed grid suspension system.
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

B. Related Sections:

1. Section 020700 Selective Demolition
2. Division 21 – Fire Protection
3. Division 22 - Plumbing
4. Divisions 23 - HVAC
5. Division 26 - Electrical Work

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
9. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.
10. ASTM E 1264 Classification for Acoustical Ceiling Products.
11. ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

12. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 13. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material.
- B. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"
 - C. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
 - D. International Code Council-Evaluation Services - Evaluation Report, ESR-1308, Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems
 - E. ASCE 7 Standard - American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
 - F. CISCA 0-2 - Ceilings and Interior Systems Construction Association Recommendations for Direct-Hung Acoustical Tile and Lay-In Panel Ceilings, Seismic Zones 0-2

1. SYSTEM DESCRIPTION

- A. Seismic Loads: Design and size components to withstand seismic loads in accordance with the International Building Code, Section 1621 for Category C.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling panel and suspension system required.
- B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- C. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less

- b. Smoke Developed: 50 or less
 2. Fire Resistance Ratings: As indicated by reference to design designations in UL Fire Resistance Directory, for types of assemblies in which acoustical ceilings function as a fire protective membrane and tested per ASTM E 119.
 - a. Protect lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Seismic Performance: Provide acoustical ceiling system that has been evaluated by an independent party and found to be compliant with the 2003 International Building Code, Seismic Category C.
 1. Tested per International Code Council - Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components as evidenced by International Code Council Evaluation Report, ESR-1308.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

A. Space Enclosure:

All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32°F (0°C) and 120°F (49°C) and not subject to Abnormal Conditions.

Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

HumiGuard Plus Ceilings: Installation of the products shall be carried out where the temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry.

The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

1.9 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 2. Grid System: Rusting and manufacturer's defects
 3. Acoustical Panels with BioBlock Plus or designated as inherently resistive to the growth of micro-organisms installed with Armstrong suspension systems: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.

1.10 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

Part 2-PRODUCTS

2.1 MANUFACTURERS

- A. Armstrong World Industries, Inc.

2.2 ACOUSTICAL CEILING UNITS

- A. 24x 24 Acoustical Ceiling Panels:
1. Armstrong 1729A 24x24 Mineral Fiber Square Edge 5/8" Acoustic Ceiling Panel
 2. 0.55 NRC
 3. White.
- B. 24x 48 Acoustical Ceiling Panels:
1. Armstrong 860 24x48 Mineral Fiber Square Edge 5/8" Acoustic Ceiling Panel
 2. 0.55 NRC
 3. White.
- C. 12 x12 Acoustical Ceiling Tiles:
1. Armstrong 746 12x12 Mineral Fiber Beveled Edge 5/8" Acoustic Ceiling Tile
 2. 0.55 NRC

3. White.

D. Acoustical Panel Suspension System:

1. Armstrong Prelude XL hot dipped galvanized metal 15/16" System, White
2. Main Tee, Cross Tee, Cross Tee and Wall Angle.

2.3.0 SUSPENSION SYSTEMS

A. Components: Main beams and cross tees In accordance with the International Building Code, Section 1621 for Category C as described in ESR-1308.

1. Structural Classification: ASTM C 635, (Intermediate Duty) (Heavy Duty).
2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
3. Prelude XL 15/16" Exposed Tee System as manufactured by Armstrong World Industries.
4. Prelude XL Fire Guard 15/16" Exposed Tee System as manufactured by Armstrong World Industries.

B. Attachment Devices: In accordance with the International Building Code, Section 1621 for Category C.

C. Wire for Hangers and Ties: In accordance with the International Building Code, Section 1621.

D. Wall Moldings: In accordance with the International Building Code, Section 1621 for Category C or method as described in ESR-1308.

1. Nominal 7/8 inch x 7/8 inch hemmed, pre-finished angle molding (7800) (7802) (7803) (780036) (HD7801)
2. Nominal 15/16 inch x 15/16 inch hemmed, pre-finished angle molding (7809)

E. Concealed Suspension Systems:

1. 11" Breather Spines (7486)
2. 4' concealed tees (7446)
3. spring boarder clips (7870)
4. 4' access angle (7447)
5. 2' access hook (7428)

F. Accessories:

1. BERC - Beam End Retaining Clip, 0.034 inch thick, hot-dipped galvanized cold-rolled steel ASTM A568 - used to join main beam or cross tee to wall molding.
2. BERC2 - 2 inch Beam End Retaining Clip, 0.034 inch thick, hot-dipped galvanized cold-rolled steel per ASTM A568 - used to join main beam or cross tee to wall molding.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION (Category C)

- A. Install suspension system and panels in accordance with the International Building Code, Section 1621, except as noted in Section 4.4.3.2 of ESR-1308, and with the authorities having jurisdiction.
- B. ESR-1308, Section 4.4.3.2, Seismic Design Category C Installation:

Terminal ends of the runners are secured by attaching the BERC clip to the wall molding and attaching the runners to the BERC clip. The runners have zero clearance at the perimeter on two adjacent walls and with 3/8-inch (9.5 mm) clearance on the opposite walls. The clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. BERC clips installed in this manner are an acceptable means of preventing runners from spreading, in lieu of spacer bars required in CISCA 0-2, which is referenced in ASCE 7, Section 9.6.2.6.2.1, which is referenced in IBC Section 1621. Except for the use of the BERC clip as noted above, installation of the ceiling system must be as prescribed by the applicable code. Maximum ceiling weight permitted is 3.35 pounds per square foot (16.35 kg/m²). This construction is equivalent to that required by CISCA 0-2, which is referenced in ASCE-7, Section 9.2.6.2.1, and which is referenced in IBC Section 1621.

Alternate #2: If Acceptable to architect, fixed attachment may be accomplished by pop-riveting the runner to the wall molding.

- C. The presence of a hanger wire within 3 inches of an expansion relief joint as called for in ASTM C 636 shall be required in addition to the requirements of the International Building Code, Section 1621.2.5 and with the authorities having jurisdiction.
 - 1. Only applies when using (Prelude XL Fire Guard 15/16") Exposed Tee Systems.
- D. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.

- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
 - 1. Ceiling Touch-Up Paint, (Item #5760, 8oz. bottles) (Item #5761, quart size cans), "global white" latex paint should be used to hide minor scratches and nicks in the surface and to cover field tegularized edges that are exposed to view.
- C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 099000 PAINTING

PART 1

1.1 SECTION INCLUDES

- A. The Work in this Section requires the surface preparation and field application of primers, paints, stains and coatings to surfaces scheduled in the Schedule.

1.2 RELATED SECTIONS

- A. Division 02 Selective Demolition
- B. Division 22 Plumbing Work
- C. Division 23 HVAC Work
- D. Division 26 Electrical Work

1.3 REFERENCES

- A. Green Seal Standard GS-11; May 20, 1993.
- B. US Green Building Council, (USGBC) - Green Seal standards for LEED paint credits.
- C. Occupational Safety and Health Act (OSHA) - Safety Standards.
- D. American National Standards Institute (ANSI) - Performance Standards.
- E. Paint Decorating Contractors of America (PDCA) - Application Standard.
- F. National Paint and Coatings Association (NPCA) - Gloss Standard.
- G. American Society for Testing Materials (ASTM) - Testing Methods.
- H. Master Paint Institute (MPI) - Established paint categories and standards.
- I. Ozone Transmission Commission (OTC) - Established levels of Volatile Organic Compounds.
- J. SCAQMD 1168 - South Coast Air Quality Management District Rule #1168; October 3, 2003.
- K. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.
- L. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.
- M. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 DEFINITIONS

- A. Commercial as used in this Section refers to a product well suited for a commercial application.
- B. DFT as used in this Section refers to the Dry Film Thickness of the coating.
- C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.
- D. DTM as used in this Section refers to paint that is applied Direct To Metal.
- E. LEED as used in this Section refers to Leadership in Energy and Environmental Design. Products listed meet LEED criteria for environmentally safe interior primers, paints and coatings.
- F. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet

the following OTC limits for VOC's.

1. Interior flat paints: 100 grams per liter or less, per gallon.
2. Interior enamels: 150 grams per liter or less, per gallon.
3. Interior stains: 250 grams per liter or less, per gallon.
4. Interior primers: 200 grams per liter or less, per gallon.
5. Rust preventive coatings: 400 grams per liter or less, per gallon.
6. Dry fog coatings: 400 grams per liter or less, per gallon.
7. Floor coatings: 250 grams per liter or less, per gallon.

- G. Premium as used in this Section refers to the best quality product "top of the line".
- H. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains. The level of VOCs appears after each product listed in the Schedule in grams per liter (g/L).
- I. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products.
1. Flat - Less than 5 Percent.
 2. Eggshell - 5 - 20 Percent.
 3. Satin - 20 - 35 Percent.
 4. Semi-Gloss - 30 - 65 Percent.
 5. Gloss - Over 65 Percent.

1.5 SUBMITTALS

- A. Product Data: Provide a complete list of all products to be used, with the following information for each:
1. Manufacturer's name, product name and/or catalog number, and general product category.
 2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.
- B. Samples: Submit three paper samples, 5 inches by 7 inches (127mm x 178mm) in size, illustrating selected colors for each color and system selected with specified coats cascaded.
- C. Manufacturer's Instructions: Indicate special surface preparation procedures.
- D. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Disposal:

1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
2. Do not incinerate closed containers.
3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.
- B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.10 EXTRA MATERIALS

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Benjamin Moore & Co.
- B. Requests for substitutions will be considered in accordance with provisions of Division 1.

2.2 MATERIALS - GENERAL

A. Volatile Organic Compound (VOC) Content:

1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D-National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

- B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

- A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.
- C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

2.4 EXTERIOR PAINT SYSTEMS

- A. Wood Trim: Provide the following finish systems over exterior wood trim:

- 1. Acrylic-Enamel Finish: Two finish coats over a primer.

- a. Primer: PPG; 6-609 SpeedHide Exterior House and Trim Wood Primer 100 Percent Acrylic Latex: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
- b. Exterior semigloss acrylic enamel finish: PPG; 6-900XI Series SpeedHide Exterior House and Trim Semi-Gloss Acrylic Latex Paint: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).

- B. Plywood: Provide the following finish systems over exterior plywood:

- 1. Acrylic Finish: Two finish coats over a primer.

- a. Primer: 6-609 SpeedHide Exterior House and Trim Wood Primer 100 Percent Acrylic Latex: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
- b. Exterior semigloss acrylic enamel finish: PPG; 6-900XI Series SpeedHide Exterior House and Trim Semi-Gloss Acrylic Latex Paint: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).

- C. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items. Match Adjacent Surfaces Color and Sheen

- 1. Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer (primer required for items not shop-primed).

- a. Primer: PPG; 6-208 Speedhide Alkyd Metal Primer: Applied at a dry film thickness of not less than 2.3 mils (0.059 mm).
- b. Exterior Semi-gloss acrylic enamel finish: PPG; 90-1210 Series Pitt-Tech Plus Interior/Exterior Semi-gloss DTM Industrial Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.050 mm).

- D. Non Ferrous Metal / Galvanized Metal: Match Existing Adjacent Surfaces Color and Sheen

- 1. Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer (primer required for items not shop-primed).

- a. Primer: PPG; 6-208 Speedhide Alkyd Metal Primer: Applied at a dry film thickness of not less than 2.3 mils (0.059 mm).
- b. Exterior Semi-gloss acrylic enamel finish: PPG; 90-1210 Series Pitt-Tech Plus Interior/Exterior Semi-gloss DTM Industrial Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.050 mm).

2.5 INTERIOR PAINT SCHEDULE

- A. CMU, Concrete Block: Match Existing Adjacent Surfaces Color and Sheen
 - 1. OTC Low VOC Paint System: (one filler coat and two finish coats).
 - a. Block Filler: Block Filler: PPG; 6-7 SpeedHide Interior/Exterior Masonry Latex Block Filler: Applied at a dry film thickness of not less than 6.0 to 12.5 mils (0.152 to 0.318 mm).
 - b. Semi-gloss Finish: PPG; 9-500 Series Pure Performance Interior Semi-Gloss Latex: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).
- B. Ferrous Metal - Doors, Frames: Match Existing Adjacent Surfaces Color and Sheen
 - 1. OTC Low VOC Paint System: Waterbase / Alkyd System: (one primer coat and two finish coats).
 - a. Primer: PPG; 6-208 Speedhide Alkyd Metal Primer: Applied at a dry film thickness of not less than 2.3 mils (0.059 mm).
 - b. Semi-gloss Finish: PPG; 9-500 Series Pure Performance Interior Semi-Gloss Latex: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).
- C. Non Ferrous Metal / Galvanized Metal: Match Existing Adjacent Surfaces Color and Sheen
 - 1. OTC Low VOC Paint System: (one prime coat and two finish coats).
 - a. PPG; 90-712 Pitt-Tech Interior/Exterior Primer/Finish DTM Industrial Enamel
 - b. Interior semigloss acrylic enamel: PPG; 6-500 Series SpeedHide Interior Semi-Gloss Latex
- D. Gypsum Board / Drywall: Match Existing Adjacent Surfaces Color and Sheen
 - 1. OTC Low VOC System: (one prime coat and two finish coats).
 - a. Primer-Zero VOC: PPG; Speedhide zero Interior Zero VOC Latex Primer 6-4900XI: Applied at a dry film thickness of not less than 1.2 mils (0.029 mm).
 - b. Interior semigloss acrylic enamel: PPG; 9-500 Series Pure Performance Interior Semi-Gloss Latex: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).

PART 3 EXECUTION

3.1 EXAMINATION

- A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.
- B. The Contractor shall review product health and safety precautions listed by the manufacturer.
- C. The Contractor shall be responsible for enforcing on site health and safety requirements associated with the Work.
- D. Do not begin installation until substrates have been properly prepared.
- E. Ensure that surfaces to receive paint are dry immediately prior to application.
- F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.

1. Concrete and Masonry: 13 percent. Allow new concrete to cure a minimum of 28 days.
 2. Exterior Wood: 17 percent.
 3. Interior Wood: 15 percent.
 4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
 5. Plaster and Gypsum: 15 percent.
 6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.
- G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.
- H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.2 PREPARATION - GENERAL

- A. Clean surfaces thoroughly prior to coating application.
- B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
- C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.
- D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.
- E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
- F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.
- G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.
- H. Protect adjacent surfaces not indicated to receive coatings.
- I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.3 SURFACE PREPARATION

- A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.
- B. Concrete Floors: Remove contaminants which could impair coating performance or appearance. Verify moisture transmission and alkaline-acid balance recommended by coating manufacturer; mechanically abrade surface to achieve 80-100 grit medium-sandpaper texture.

- C. Existing Coatings:
 - 1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
 - 2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.
- D. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.
- E. Masonry Surfaces - Restored: Remove loose particles, sand, efflorescence, laitance, cleaning compounds and other substances that could impair coating performance or appearance.
- F. Metals - Aluminum, Mill-Finish: Clean and etch surfaces with a phosphoric acid-water solution or water based industrial cleaner. Flush with clean water and allow to dry, before applying primer coat.
- G. Metals - Copper: Clean surfaces with pressurized steam, pressurized water, or solvent washing.
- H. Metals - Ferrous, Unprimed: Remove rust or scale, if present, by wire brush cleaning, power tool cleaning, or sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning, with phosphoric-acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.
- I. Metals - Ferrous, Shop-Primed: Remove loose primer and rust, if present, by scraping and sanding, feathering edges of cleaned areas to produce uniform flat surface; solvent-clean surfaces and spot-prime bare metal with specified primer, feathering edges to produce uniform flat surface.

3.4 APPLICATION - GENERAL

- A. Application of primers, paints, stains or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.
- B. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
- D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5 feet (1.5 m).
- E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
- F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
- G. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.

- H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.5 CLEANING

- A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.
- B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.
- C. Reconnect equipment adjacent to surfaces indicated to receive coatings.
- D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.
- E. Remove protective materials.

3.6 PROTECTION AND REPAIR

- A. Protect completed coating applications from damage by subsequent construction activities.
- B. Repair to Architect's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Architect's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

END OF SECTION

SECTION 21 0400 - GENERAL CONDITIONS FOR FIRE PROTECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This section applies to certain sections of Division 26, "Electrical," and this section applies to all sections of Division 23, "Mechanical" of this project specification unless specified otherwise in the individual sections.

1.2 DESCRIPTION

- A. The General Conditions and Supplementary General Conditions are a part of this Division and are to be considered a part of this Contract.
- B. Where items of the General Conditions and Supplementary General Conditions are repeated in other Sections of the Specifications, it is merely intended to qualify or to call particular attention to them. It is not intended that any other parts of the General Conditions and Supplementary General Conditions shall be assumed to be omitted if not repeated therein. This Section applies equally and specifically to all Contractors supplying labor and/or equipment and/or materials as required under each Section of this Division. Where conflicts exist between the drawings and the specifications or between this section of the specifications and other sections, the more stringent or higher cost option shall apply.

1.3 INTENT

- A. It is the intent of the Specifications and Drawings to call for finished work, tested and ready for operation.
- B. Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation as determined by good trade practice even if not particularly specified, shall be furnished, delivered and installed under their respective Divisions without any additional expense to the Owner.
- C. Minor details not usually shown or specified but necessary for proper installation and operation shall be included in the work as though they were hereinafter shown or specified.
- D. Work under each Section shall include giving written notice to the Owner and Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, it is mutually agreed that work under each Section includes the cost of all required items for the accepted, satisfactory functioning of the entire system without extra compensation.

1.4 DEFINITIONS

- A. Approve: The term "approved," where 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 General and Supplementary Conditions.
- B. "Approved equal" mean any product which in the opinion of the Engineer is equal in quality, arrangement, appearance, and performance to the product specified.
- C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.
- D. "Finished" refers to all rooms and areas to be specified to receive architectural treatment as indicated on the drawings. All rooms and areas not covered, including underground tunnels and areas above ceilings shall be considered not finished, unless otherwise noted.
- E. "Furnish" or "supply" shall mean purchase, deliver to, and off-load at the job site, ready to be installed including where appropriate all necessary interim storage and protection.
- F. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- G. "Install" shall mean set in place complete with all mounting facilities and connections as necessary ready for normal use or service.
- H. "Product" shall mean any item of equipment, material, fixture, apparatus, appliance or accessory installed under this Division.
- I. "Provide" shall mean furnish (or supply) and install as necessary.
- J. Regulation: 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.
- K. Remove: The term "remove" means "to disconnect from its present position, remove from the premises and to dispose of in a legal manner."
- L. Special Warranties: The term "Special Warranties" are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.
- M. Standard Product Warranties: The term "Standard Product Warranties" are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

- N. "Subcontractor" means specifically the subcontractor working under this Division. Other Contractors are specifically designated "Plumbing Subcontractor", "General Contractor" and so on. Note: Take care to ascertain limits of responsibility for connecting equipment which requires connections by two or more trades.
- O. Substitutions: Requests for changes in products, materials, equipment, and methods of construction proposed by the Contractor are considered requests for "substitutions."
- P. "Wiring" shall mean cable assembly, raceway, conductors, fittings and any other necessary accessories to make a complete wiring system.

1.5 DRAWINGS

- A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the Contract. Consult the Architectural Drawings and Details for exact location of fixtures and equipment; where same are not definitely located, obtain this information from the Architect. (Do not scale the drawings)
- B. Work under each Section shall closely follow Drawings in layout of work; check Drawings of other Divisions to verify spaces in which work will be installed. Maintain maximum headroom; where space conditions appear inadequate, Owner and Engineer shall be notified before proceeding with installations.
- C. The Owner may, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades and/or for proper execution of the work.
- D. Where variances occur between the Drawings and Specifications or within either of the Documents, the item or arrangement of better quality, shall be included in the Contract price. The Owner and Engineer shall decide on the item and the manner in which the work shall be installed.

1.6 SURVEYS AND MEASUREMENTS

- A. Before submitting his Bid, the Contractors shall visit the site and become thoroughly familiar with all existing conditions under which work will be installed. This Contract includes all modifications of existing systems required for the installation of new equipment. This Contract includes all necessary offsets, transitions and modifications required to install all new equipment in existing spaces. All new and existing equipment and systems shall be fully operational under this Contract before the job is considered complete. The Contractors shall be held responsible for any assumptions he makes, any omissions or errors he makes as a result of his failure to become fully familiar with the existing conditions at the site and the Contract Documents.
- B. The Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.

- C. Should the Contractor discover any discrepancies between actual measurements and those indicated which prevent following good practice or which interfere with the intent of the Drawings and Specifications, the Engineer will be notified and work will not proceed until instructions from the Engineer are received.

1.7 CODES AND STANDARDS

A. Reference Standard Compliance

1. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
2. Independent Testing Organization Certificate: In lieu of the label or listing indicated above, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

- B. The Following Codes and Standards listed below apply to all mechanical work. Wherever Codes and/or Standards are mentioned in these Specifications, the latest applicable edition or revision shall be followed:

Connecticut State Building Code

The International Building Code

The International Mechanical Code

The International Plumbing Code

The International Energy Conservation Code

The National Electrical Code

NFPA 101 Life Safety

ASHRAE 90.1 and International Energy Conservation Code

- C. The following Standards shall be used where referenced by the following abbreviations:

AABC Associated Air Balance Council

ACGIH American Conference of Governmental Industrial Hygienists

ADC Air Diffusion Council

AGA American Gas Association

AIA American Institute of Architects

AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CGA	Compressed Gas Association
CSA	Canadian Standards Association
CISPI	Cast Iron Soil Pipe Institute
EJMA	Expansion Joint Manufacturing Association
EPA	Environmental Protection Agency
FM	Factory Mutual
FSSC	Federal Specification
HIS	Hydraulic Institute Standards
IEEE	Institute of Electrical and Electronics Engineers
IRI	Industrial Risk Insurers
ISO	Insurance Services Office
MCAA	Mechanical Contractors Association of America
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEMA	National Electrical Manufacturers Association

NFPA	National Fire Protection Association
NOFI	National Oil Fuel Institute
NSC	National Safety Council
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
PDI	Plumbing and Drainage Institute
SBI	Steel Boiler Industry (Division of Hydronics Institute)
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
STI	Steel Tank Institute
UL	Underwriters' Laboratories

- D. All materials furnished and all work installed shall comply with the rules and recommendations of the NFPA, the requirements of the local utility companies, the recommendations of the fire insurance rating organization having jurisdiction and the requirements of all Governmental departments having jurisdiction.
- E. The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and Drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether shown on Drawings and/or specified or not.

1.8 PERMITS AND FEES

- A. The Contractor shall give all necessary notices, obtain all permits; and pay all Government and State sales taxes and fees where applicable, and other costs, including utility connections or extensions in connection with the work, file all necessary Drawings, prepare all documents and obtain all necessary approvals of all Governmental and State departments having jurisdiction, obtain all required certificates of inspection for his work, and deliver a copy to the Owner and Engineer before request for acceptance and final payment for the work.

1.9 EQUIPMENT SUBSTITUTIONS

- A. In these Specifications and on the accompanying Drawings, one or more makes of materials, apparatus or appliances may have been specified for use in this installation. This has been done for convenience in fixing the standard of workmanship, finish and design required for installation. The details of workmanship, finish and design, and the guaranteed performance of any material, apparatus or appliance which the Contractor desires to deviate from those mentioned herein shall also conform to these standards.
- B. Where no specific make of material, apparatus or appliance is mentioned any first-class product made by a reputable manufacturer may be submitted for the Engineers review.

- C. Where two or more names are given as equivalents, the Contractor must use the specified item or one of the named equivalents. Where one name only is used and is followed by the words “or approved equal”, the Contractor must use the item named or he may apply for a substitution. Where one name only is used, the Contractor must use that item named.
- D. Equipment, material or devices submitted for review as an “equivalent” shall meet the following requirements:
1. The equivalent shall have the same construction features such as, but not limited to:
 - a) Material thickness, gauge, weight, density, etc.
 - b) Welded, riveted, bolted, etc., construction.
 - c) Finish, undercoating, corrosion protection.
 2. The equivalent shall perform with the same or better operating efficiency.
 3. The equivalent shall be locally represented by the manufacturer for service, parts and technical information.
- E. Where the Contractor proposes to deviate from the equipment or materials as hereinafter specified, he shall do so by making a request in writing. The Contractor shall state in his request the amount of credit or extra cost involved. A copy of said request shall be included in the Mechanical Base Bid with manufacturer’s equipment cuts. The Base Bid shall be based on using the materials and equipment as specified with no exceptions.
- F. Where the Contractor proposes to use an item of equipment other than specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign and all new drawings and detailing required therefore shall be prepared by the Designers of Record at the expense of the Contractor and at no additional cost to the Owner.
- G. Where such accepted substitution requires a different quantity and arrangement of piping, ductwork, valves, pumps, insulation, wiring, conduit and equipment from that specified or indicated on the Drawings, the Contractor shall, with the acceptance by the Engineer, furnish and install any such additional equipment required by the system at no additional cost to the Owner, including any costs added to other trades due to the substitution.
- H. Equipment, material or devices submitted for review as a “substitution” shall meet the following requirements:
1. Substitution Request Submittal: Requests for substitution will be considered if received in writing 14 days before the bid date. Requests received later than 14 days before the bid date may be considered or rejected at the discretion of the Engineer.
 - a. Submit three (3) copies of each request for substitution for consideration.
 - b. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - 1) Product Data, including Drawings and descriptions of products, fabrication and installation procedures.

- 2) Samples, where applicable or requested.
 - 3) A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - 4) 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 become necessary to accommodate the proposed substitution.
 - 5) A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - 6) Cost information, including a proposal of the net change, if any in the Contract Sum.
 - 7) Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
2. Engineer's Action: Within one week of receipt of the request for substitution, the Engineer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance of a product substitution will be in the form of an Addendum.
 3. Other Conditions: The Contractor's substitution request will be received and considered by the Engineer when one or more of the following conditions are satisfied, as determined by the Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - a. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - b. A substantial advantage is offered to the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

1.10 SUBMITTAL PROCEDURES

- A. Provide Submittals in accordance with the requirements of Division 1 and as indicated in the following.
- B. 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. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 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. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
 - 1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 - 3. Allow two weeks for reprocessing each submittal.
 - 4. 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.
- D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Submittals shall be arranged in order of specification sections.
 - 1. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number, title and paragraph of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements,

including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

- F. Except for submittals for record, information or similar purposes, the Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
- G. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, to indicate the action taken.

1.11 SHOP DRAWINGS

- A. Submit neatly prepared information, drawn to accurate 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 considered Shop Drawings.
- B. The Contractor shall submit for review detailed shop drawings of all equipment and material specified in each section and coordinated ductwork layouts. No material or equipment may be delivered to the job site or installed until the Contractor has received shop drawings for the particular material or equipment which have been properly reviewed. Shop drawings shall be submitted within 60 days after award of Contract before any material or equipment is purchased. The Contractor shall submit for review copies of all shop drawings to be incorporated in the Mechanical Contract. Refer to Division 1 for the quantity of copies required for submission. Where quantities are not specified, provide seven (7) copies for review.
- C. Provide shop drawings for all devices specified under equipment specifications for all systems. Shop drawings shall include manufacturers' names, catalog numbers, cuts, diagrams, dimensions, identification of products and materials included, compliance with specified standards, notation of coordination requirements, notation of dimensions established by field measurement and other such descriptive data as may be required to identify and accept the equipment. A complete list in each category (example: all fixtures), of all shop drawings, catalog cuts, material lists, etc., shall be submitted to the Engineer at one time. No consideration will be given to a partial shop drawing submittal.
- D. When a submittal could involve more than one trade, e.g., valves, piping, etc., the submitted shall be separated by traded involved, ie. HVAC, plumbing, fire protection, etc.
- E. Where multiple quantities or types of equipment are being submitted, provide a cover sheet (with a list of contents) on the submittal identifying the equipment or material being submitted.
- F. The Contractor shall furnish all necessary templates, patterns, etc., for installation work and for the purpose of making adjoining work conform; furnish setting plans and shop details to other trades as required.

- G. “No Exception Taken” rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, review does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the Contract Drawings and Specifications. Verify available space prior to submitting shop drawings. Review of shop drawings shall not apply to quantity of material.
- H. After shop drawings have been reviewed, with no exceptions taken, no further changes will be allowed without the written consent of the Engineer.
- I. Shop Drawings shall be submitted and approved prior to installation.
- J. Shop drawing submittal sheets which may show items that are not being furnished shall have those items crossed off to clearly indicate which items will be furnished.
- K. Bidders shall not rely on any verbal clarification of the Drawings and/or Specifications. Any questions shall be referred to the Engineer in writing at least five (5) working days prior to Bidding to allow for issuance of an Addendum.
- L. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- M. Prepare sheetmetal and sprinkler shop drawings drawn in the latest REVIT version to a minimum scale of 1/4" = 1' - 0". Final approved drawings shall be turned over to the Owner on floppy disk or CD Rom.

1.12 COORDINATION DRAWINGS

- A. Prepare coordination drawings drawn in the latest REVIT version in accordance with Division 1 to a minimum scale of 1/4"=1'-0" detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. The Contractor shall indicate the proposed locations of piping, conduit, ductwork, equipment, and materials. Include the following:
 - a. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - b. Equipment connections and support details.
 - c. Exterior wall and foundation penetrations.
 - d. Fire-rated wall and floor penetrations.
 - e. Sizes and locations of required concrete pads and bases.
- B. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

- C. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
- D. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.
- E. The Contractor and each subcontractor shall sign and date each coordination drawing prior to submission.
- F. Work shall not be performed until coordination drawings have been approved by the architect and engineer.
- G. Electronic copies of the MEP floor plans are available to use as a basis for preparing coordination drawings and can be provided by the Engineer. If the Contractor elects to obtain the Engineers electronic files a REVIT File Release Form must be submitted with payment. This form must be signed by the Contractor, Owner, and Architect. Upon receipt of a signed copy of the REVIT File Release Form, and payment, the Engineer will provide copies of the electronic files for the Contractor's use. A copy of the REVIT File Release Form is appended to the end of this specification section

1.13 COORDINATION WITH OTHER DIVISIONS

- A. All work shall be carried out in conjunction with other trades and full cooperation shall be given in order that all work may proceed with a minimum of delay and interference. Particular emphasis is placed on timely installation of major apparatus and furnishing other Contractors, especially the Contractor or Construction Manager, with information as to openings, chases, sleeves, bases, inserts, equipment locations, panels, etc., required by other trades.
- B. The Contractors are required to examine all of the Project Drawings and mutually arrange work so as to avoid interference with the work of other trades. In general, ductwork, HVAC piping, sprinkler piping and drainage lines take precedence over water, gas and electrical conduits. The Engineer shall make final decisions regarding the arrangement of work which cannot be agreed upon by the Contractors.
- C. Where the work of the Contractor will be installed in close proximity to or will interfere with work of other trades, the Contractors will cooperate in working out space conditions to make a satisfactory adjustment.
- D. If the work under a Section is installed before coordinating with other Divisions or Sections or so as to cause interference with work of other Sections, the necessary changes to correct the condition shall be made by the Contractor causing the interference without extra charge to the Owner.

1.14 WORKMANSHIP

- A. Service Support: The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- B. Modification of References: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears.
- C. The Contractor shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of the work together with all skilled workmen, fitters, metal workers, welders, helpers and laborers required to unload, transfer, erect, connect, adjust, start, operate and test each system.
- D. Unless otherwise specifically indicated on the Drawings or Specifications, all equipment and materials shall be installed with the acceptance of the Engineer and in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.
- E. All labor for installation of mechanical systems shall be performed by experienced, skilled tradesmen under the supervision of a licensed journeyman foreman. All work shall be of a quality consistent with good trade practice and shall be installed in a neat, workmanlike manner. The Engineer reserves the right to reject any work which, in his opinion, has been installed in a substandard, dangerous or unserviceable manner. The Contractor shall replace said work in a satisfactory manner at no extra cost to the Owner.

1.15 SHUTDOWNS

- A. When installation of a new system requires the temporary shutdown of an existing operating system, the connection of the new system shall be performed at such time as designated by the Owner.
- B. The Engineer and the Owner shall be notified in writing of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance whenever possible. The Contractor shall provide all necessary labor, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.

1.16 TEMPORARY UTILITIES

- A. General: Provide new materials and equipment; if acceptable to the Engineer, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.
- C. First Aid Supplies: Comply with governing regulations.
- D. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
- E. Utilities: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.
- F. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
- G. Temporary Heat-Cool-Dehumidification: Provide temporary services required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate temporary services to produce the ambient condition required and minimize consumption of energy. The building's permanent HVAC systems shall not be used for these purposes.
- H. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- I. Termination and Removal: Unless the Engineer requires that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

1.17 PROJECT PHASING

- A. Work under each Section shall include all necessary temporary connections, equipment, piping, heating, temperature control work, fire stopping, water heaters, labor, and material as necessary to accommodate the phasing of Construction as developed by the General Contractor or Construction Manager and approved by the Owner. All existing systems that pass-thru an area of the building shall remain operational during all phases of construction. No extra compensation shall be granted the Contractor for work required to maintain existing systems operational or to accommodate the construction phasing of the project.

1.18 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Work under each Section shall include protecting the work and material of all other Sections from damage by work or workmen and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until the facility has been accepted by the Owner. Protect work against theft, injury or damage and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material.
- C. Work under each Section includes receiving, unloading, uncrating, storing, protecting, setting in place and completely connecting equipment supplied under each Section. Work under each Section shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt and/or damage by workmen or machinery. Insure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.19 ADJUSTING AND TESTING

- A. After all the equipment and accessories to be furnished are in place, they shall be put in final adjustment and subjected to such operating tests so as to assure the Engineer that they are in proper adjustment and in satisfactory, permanent operating condition.
- B. Where requested by the Engineer, a factory-trained service representative shall inspect the installation and assist in the initial startup and adjustment to the equipment. The period of these services shall be for such time as necessary to secure proper installation and adjustments. After the equipment is placed in permanent operation, the service representative shall supervise the initial operation of the equipment and instruct personnel responsible for operation and maintenance of the equipment. The service representative shall notify the Contractor in writing, that the equipment was installed according to manufacturers recommendations and is operating as intended by the manufacturer.

1.20 CLEANING

- A. The Contractor shall thoroughly clean and flush all piping, ducts (including ETR ducts) and equipment of all foreign substances, oils, burrs, solder, flux, etc., inside and out before being placed in operation.
- B. If any part of a system should be stopped or damaged by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and/or remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected at no additional cost to the Owner.
- C. During the course of construction, all ducts (including ETR ducts) and pipes shall be capped in an acceptable manner to insure adequate protection against the entrance of foreign matter.
- D. Upon completion of all work under the Contract, the Contractor shall remove from the premises all rubbish, debris and excess materials left over from his work. Any oil or grease stains on floor areas caused by the Contractor shall be removed and floor areas left clean.
- E. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - 1. Remove labels that are not permanent labels.
 - 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- F. 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 Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove and dispose of ALL waste materials, packaging material, skids etc. from the site and dispose of in a lawful manner in accordance with municipal, state and federal regulations.
- G. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

1.21 OPERATING AND MAINTENANCE

- A. Upon completion of all work and tests, the Contractor shall furnish the necessary skilled labor and helpers for operating his system and equipment for a period specified under each applicable Section of this Division. During this period, he shall fully instruct the Owner or the Owner's representative in the operation, adjustment and maintenance of all equipment furnished. The Contractor shall give at least seven (7) days notice to the Owner and the Engineer in advance of this period.
- B. The Contractor shall include the maintenance schedule for the principal items of equipment furnished under this Division.
- C. The Contractor shall physically demonstrate procedures for all routine maintenance of all equipment furnished under each respective Section to assure accessibility to all devices.
- D. An authorized manufacturer's representative shall attest in writing that the equipment has been properly installed prior to startup of any major equipment. The following equipment will require this inspection: pumps; air conditioning equipment, controls, air handling equipment, compressors, boilers etc. These letters shall be bound into the operating and maintenance books.
- E. Refer to individual trade Sections for any other particular requirements related to operating instructions.
- F. Demonstration shall be recorded on VHS audio/video tape with two (2) tapes turned over to the Owner.

1.22 OPERATING AND MAINTENANCE MANUALS

- A. Prepare operating and maintenance manuals in accordance with the requirements of Division 1 and as follows. The Contractor shall prepare five (5) copies of a complete maintenance and operating instructions manual, bound in booklet form. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 3-ring vinyl-covered binders, with pocket folders for folded sheet information and designation partitions with identification tabs. Mark appropriate identification on front and spine of each binder.
- B. Manual shall include the following:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing and operating instructions including lubrication charts and schedules.
 - 5. Emergency and safety instructions.

6. Spare parts list.
 7. Copies of warranties.
 8. Wiring diagrams.
 9. Recommended "turn around" cycles.
 10. Inspection procedures.
 11. Approved Shop Drawings and Product Data.
 12. Equipment Start-up Reports.
 13. Temperature control diagrams and written sequences of operations.
 14. Balance reports.
- C. Include in the manual, a tabulated equipment schedule for all equipment. Schedule shall include pertinent data such as: make, model number, serial number, voltage, normal operating current, belt size, filter quantities and sizes, bearing number, etc. Schedule shall include maintenance to be done and frequency.
- D. Maintenance and instruction manuals shall be submitted to the Owner at the same time as the seven (7) day notice is given prior to the instruction period.

1.23 ACCEPTANCES

- A. The equipment, materials, workmanship, design and arrangement of all work installed under the Mechanical Sections shall be subject to the review of the Engineer.
- B. Within 30 days after the awarding of a Contract, the Mechanical Contractor shall submit to the Engineer, for review, a list of manufacturers of equipment proposed for the work under the Mechanical Sections. The intent to use the exact manufacturers and models specified does not relieve the Contractor of the responsibility of submitting such a list.
- C. If extensive or unacceptable delivery time is expected on a particular item of equipment specified, the Contractor shall notify the Owner and Engineer, in writing, within 30 days of award of the Contract. In such instances, equipment substitutions may be made pending acceptance by the Engineer or the Owner's representative.
- D. Where any specific material, process or method of construction or manufactured article is specified by reference to the catalog number of a manufacturer, the Specifications are to be used as a guide and are not intended to take precedence over the basic duty and performance specified or noted on the Drawings. In all cases, the Mechanical Contractor shall verify the duty specified with the specific characteristics of the equipment offered for review. Equipment characteristics are to be used as mandatory requirements where the Contractor proposes to use an acceptable equivalent.
- E. If material or equipment is installed before it is reviewed and/or approved, the Contractor shall be liable for its removal and replacement at no extra charge to the Owner if, in the opinion of the Engineer, the material or equipment does not meet the intent of, or standard of quality implied by, the Drawings and Specifications.
- F. Failure on the part of the Engineer to reject shop drawings or to reject work in progress shall not be interpreted as acceptance of work not in conformance with the Drawings and/or Specifications. Work not in conformance with the Drawings and/or Specifications shall be corrected whenever it is discovered.

1.24 RECORD DRAWINGS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.
- B. Maintain a clean, 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 whichever drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Items to be indicated include but are not limited to:
 - 1. Dimensional change
 - 2. Revision to drawing detail
 - 3. Location and depth of underground utility
 - 4. Revision to pipe routing
 - 5. Revision to electrical circuitry
 - 6. Actual equipment location
 - 7. Duct size and routing
 - 8. Location of concealed internal utility
 - 9. Changes made by Change Order
 - 10. Details not on original Contract Drawing
 - 11. Information on concealed elements which would be difficult to identify or measure later
- C. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
- D. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
- E. Note related Change Order numbers where applicable.
- F. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- G. These shall be clearly marked for Record Drawings on a clean set of reproducible mylar sepias at the completion of the work and turned over to the Owner.
- H. Final record documents shall be prepared in the latest AutoCad version and floppy disks or CD Rom of all drawings and a clean set of reproducible mylar sepias shall be turned over to the Owner at the completion of the work.

1.25 WARRANTIES AND BONDS

- A. The following general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties are to be included:
 - 1. General close-out requirements included in Division 1.

2. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of Divisions-2 through -26.
 3. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

1.26 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. 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.
- C. 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 Contract Documents. The 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.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, right and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer'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 Engineer.

- H. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.
- I. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - 1. Refer to individual Sections of Divisions-2 through -26 for specific content requirements, and particular requirements for submittal of special warranties.
- J. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- K. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
 - 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.
 - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.27 GUARANTEES

- A. The Contractor shall guarantee all material and workmanship under these Specifications and the Contract for a period of one (1) year from the date of final acceptance by Owner. During this guarantee period, all defects developing through faulty equipment, materials or workmanship shall be corrected or replaced immediately by this Contractor without expense to the Owner. Such repairs or replacements shall be made to the Engineer's satisfaction.
- B. Contractor shall provide name, address, and phone number of all contractors and subcontractors and associated equipment they provided.

1.28 PROJECT CLOSE-OUT

- A. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents in accordance with Division 1.
- B. Deliver tools, spare parts, extra stock, and similar items.

- C. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- D. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- E. Field Observation Procedures: On receipt of a request for an Engineers Field Observation, the Engineer will advise the Contractor of unfulfilled requirements. The Engineer will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Engineer will repeat the Field Observation when requested and assured that the Work has been substantially completed.
 - 2. Results of the completed list of unfulfilled items will form the basis of requirements for final acceptance.

END OF SECTION 21 0400

REVIT File Release Form

DELIVERY OF REVIT FILES FOR: _____

Project Name

In accepting and utilizing any drawings or other data on any form of electronic media generated and provided by the Design Professional, the Client covenants and agrees that all such drawings and data are instruments of service of the Design Professional, who shall be deemed the author of the drawings and data, and shall retain all common law, statutory law and other rights, including copyrights.

The Client further agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this Agreement. The Client agrees to waive all claims against the Design Professional resulting in any way from any unauthorized changes or reuse of the drawings and data for any other project by anyone other than the Design Professional.

In addition, the Client agrees, to the fullest extent permitted by law, to indemnify and hold the Design Professional harmless from any damage, liability or cost, including reasonable attorneys' fees and costs of defense, arising from any changes made by anyone other than the Design Professional or from any reuse of the drawings and data without the prior written consent of the Design Professional.

Under no circumstances shall transfer of the drawings and other instruments of service on electronic media for use by the Client be deemed a sale by the Design Professional, and the Design Professional makes no warranties, either express or implied, of merchantability and fitness for any particular purpose.

Client's Signature

Date

Company - Title

Architects' Signature

Date

Firm - Title

Owner's Signature

Date

Company - Title

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SECTION 22 0400 - GENERAL CONDITIONS FOR PLUMBING

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This section applies to certain sections of Division 26, "Electrical," and this section applies to all sections of Division 23, "Mechanical" of this project specification unless specified otherwise in the individual sections.
- C. The Drawings of other trades (Architectural, Food Service, Structural, Landscape, Civil, Mechanical, Fire Protection and Electrical) shall be examined for coordination and familiarity of work with other Contractors. Any duplication or omission of provisions in this project should be brought to the attention of the Owners prior to Bidding.

1.2 DESCRIPTION

- A. The General Conditions and Supplementary General Conditions are a part of this Division and are to be considered a part of this Contract.
- B. Where items of the General Conditions and Supplementary General Conditions are repeated in other Sections of the Specifications, it is merely intended to qualify or to call particular attention to them. It is not intended that any other parts of the General Conditions and Supplementary General Conditions shall be assumed to be omitted if not repeated therein. This Section applies equally and specifically to all Contractors supplying labor and/or equipment and/or materials as required under each Section of this Division. Where conflicts exist between the drawings and the specifications or between this section of the specifications and other sections, the more stringent or higher cost option shall apply.

1.3 INTENT

- A. It is the intent of the Specifications and Drawings to call for finished work, tested and ready for operation.
- B. Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation as determined by good trade practice even if not particularly specified, shall be furnished, delivered and installed under their respective Divisions without any additional expense to the Owner.
- C. Minor details not usually shown or specified but necessary for proper installation and operation shall be included in the work as though they were hereinafter shown or specified.
- D. Work under each Section shall include giving written notice to the Owner and Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws,

ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, it is mutually agreed that work under each Section includes the cost of all required items for the accepted, satisfactory functioning of the entire system without extra compensation.

- E. Provide all labor, materials, equipment, and services necessary for and incidental to the complete installation and operation of all plumbing/ mechanical work.
- F. Unless otherwise specified, all submissions shall be made to, and acceptances and approvals made by Architect and Engineer.
- G. Conform to the requirements of all rules, regulations and codes of local, state and federal authorities having jurisdiction.
- H. Coordinate the work under Division 22 with the work of all other trades.
- I. Be responsible for all construction means, methods, techniques, procedures and phasing sequences used in the work. Furnish all tools, equipment and materials necessary to properly perform the work in first class, substantial, and workman like manner, in accordance with the full intent and meaning of the contract drawings.

1.4 DEFINITIONS

- A. Approve: The term "approved," where used in conjunction with the Engineer's action on the Contractors submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in General and Supplementary Conditions.
- B. No Exceptions Taken – reviewed and determined to be in general conformance with contract documents.
- C. "Approved equal" also known as "alternative" mean any product which in the opinion of the Engineer is equal in quality, arrangement, appearance, and performance to the product specified.
- D. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.
- E. "Finished" refers to all rooms and areas to be specified to receive architectural treatment as indicated on the drawings. All rooms and areas not covered, including underground tunnels and areas above ceilings shall be considered not finished, unless otherwise noted.
- F. "Furnish" or "supply" shall mean purchase, deliver to, and off-load at the job site, ready to be installed including where appropriate all necessary interim storage and protection.
- G. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

- H. “Install” shall mean set in place complete with all mounting facilities and connections as necessary ready for normal use or service.
- I. "Lead Free" shall mean not more than .25% in the wetted surface area.
- J. “Product” shall mean any item of equipment, material, fixture, apparatus, appliance or accessory installed under this Division.
- K. “Provide” shall mean furnish (or supply) and install as necessary.
- L. Regulation: 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.
- M. Remove: The term “remove” means “to disconnect from its present position, remove from the premises and to dispose of in a legal manner.”
- N. Special Warranties: The term “Special Warranties” are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.
- O. Standard Product Warranties: The term “Standard Product Warranties” are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- P. “Subcontractor” means specifically the subcontractor working under this Division. Other Contractors are specifically designated “Plumbing Subcontractor”, “General Contractor” and so on. Note: Take care to ascertain limits of responsibility for connecting equipment which requires connections by two or more trades.
- Q. Substitutions: Requests for changes in products, materials, equipment, and methods of construction proposed by the Contractor are considered requests for "substitutions."
- R. “Wiring” shall mean cable assembly, raceway, conductors, fittings and any other necessary accessories to make a complete wiring system.

1.5 DRAWINGS

- A. Contract drawings are diagrammatic and indicate the general arrangement of all systems and work included in the Contract. All offsets, fittings, transitions and accessories are not necessarily indicated/ shown. Furnish and install all such items as may be required to fit the work to the conditions encountered. Arrange piping, equipment and other work generally as shown on the contract drawings, provide proper clearances and access. Where departures are proposed because of field conditions or other causes, prepare and submit detailed shop drawings for approval in accordance with “Submittals” specified below. The right is reserved to make reasonable changes in location of equipment, piping, fixtures and ductwork, up to the time of rough-in or fabrication. Consult the Architectural Drawings and Details for exact location of fixtures and equipment; where same are not definitely located, obtain this information from the Architect. (Do not scale the drawings).

- B. Work under each Section shall closely follow Drawings in layout of work; check Drawings of other Divisions to verify spaces in which work will be installed. Maintain maximum headroom; where space conditions appear inadequate, Owner and Engineer shall be notified before proceeding with installations.
- C. The Owner may, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades and/or for proper execution of the work.
- D. Where variances occur between the Drawings and Specifications or within either of the Documents, the item or arrangement of better quality, shall be included in the Contract price. The Owner and Engineer shall decide on the item and the manner in which the work shall be installed.

1.6 SURVEYS AND MEASUREMENTS

- A. Before submitting his Bid, the Contractors shall visit the site and become thoroughly familiar with all existing conditions under which work will be installed. This Contract includes all modifications of existing systems required for the installation of new equipment. This Contract includes all necessary offsets, transitions and modifications required to install all new equipment in existing spaces. All new and existing equipment and systems shall be fully operational under this Contract before the job is considered complete. The Contractors shall be held responsible for any assumptions he makes, any omissions or errors he makes as a result of his failure to become fully familiar with the existing conditions at the site and the Contract Documents.
- B. The Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.
- C. Should the Contractor discover any discrepancies between actual measurements and those indicated which prevent following good practice or which interfere with the intent of the Drawings and Specifications, the Engineer will be notified and work will not proceed until instructions from the Engineer are received.

1.7 CODES AND STANDARDS

- A. Reference Standard Compliance
 - 1. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
 - 2. Independent Testing Organization Certificate: In lieu of the label or listing indicated above, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified

organization's test methods and that the item complies with the specified organization's reference standard.

- B. The Following Codes and Standards listed below apply to all plumbing work. Wherever Codes and/or Standards are mentioned in these Specifications, the latest applicable edition with all amendments or revision shall be followed:
- Connecticut State Building Code - Connecticut Supplement
 - The International Building Code
 - The International Mechanical Code
 - The International Plumbing Code
 - The International Energy Conservation Code
 - The National Electrical Code
 - NFPA 101 Life Safety
 - ASHRAE 90.1 and International Energy Conservation Code
- C. The following Standards shall be used where referenced by the following abbreviations:
- | | |
|--------|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| AGA | American Gas Association |
| AIA | American Institute of Architects |
| ANSI | American National Standards Institute |
| API | American Petroleum Institute |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASPE | American Society of Plumbing Engineers |
| ASSE | American Society of Sanitary Engineers |
| ASTM | American Society of Testing and Materials |
| AWS | American Welding Society |
| AWWA | American Water Works Association |
| CGA | Compressed Gas Association |
| CSA | Canadian Standards Association |
| CISPI | Cast Iron Soil Pipe Institute |
| EJMA | Expansion Joint Manufacturing Association |
| EPA | Environmental Protection Agency |
| FM | Factory Mutual |
| FSSC | Federal Specification |
| HIS | Hydraulic Institute Standards |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRI | Industrial Risk Insurers |
| ISO | Insurance Services Office |
| MCAA | Mechanical Contractors Association of America |
| NBS | National Bureau of Standards |
| NEBB | National Environmental Balancing Bureau |
| NEMA | National Electrical Manufacturers Association |
| NFPA | National Fire Protection Association |
| NOFI | National Oil Fuel Institute |
| NSC | National Safety Council |
| NSF | National Sanitation Foundation |
| OSHA | Occupational Safety and Health Administration |
| PDI | Plumbing and Drainage Institute |
| SBI | Steel Boiler Industry (Division of Hydronics Institute) |

SDWA	Safe Drinking Water Act
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
STI	Steel Tank Institute
UL	Underwriters' Laboratories

- D. All materials furnished and all work installed shall comply with the rules and recommendations of the NFPA, the requirements of the local utility companies, the recommendations of the fire insurance rating organization having jurisdiction and the requirements of all Governmental departments having jurisdiction.
- E. The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and Drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether shown on Drawings and/or specified or not.

1.8 PERMITS AND FEES

- A. The Contractor shall give all necessary notices, obtain all permits; and pay all Government and State sales taxes and fees where applicable, and other costs, including utility connections or extensions in connection with the work, file all necessary Drawings, prepare all documents and obtain all necessary approvals of all Governmental and State departments having jurisdiction, obtain all required certificates of inspection for his work, and deliver a copy to the Owner and Engineer before request for acceptance and final payment for the work.

1.9 EQUIPMENT SUBSTITUTIONS

- A. Substitutions: Division 01, Section 012300 Alternates, Section 012500 – Substitution Procedures – Substitution Request Form and Section 016000 - Product Requirements.
- B. In these Contract Documents, one or more makes of materials, apparatus or appliances may have been specified for use in this installation. These describe the basis of design and approved equivalents. This has been done for convenience in fixing the standard of workmanship, finish and design required for installation without consideration of any or all costs associated but not limited to (structural, mechanical, or electrical feeder, breaker, or transformer requirements). The Contractor acknowledges that not all requirements are shown for either alternate acceptable manufacturers listed or those alternates requiring a request for substitution and it is their responsibility to coordinate all requirements necessary to accommodate any change from the basis of design listed or scheduled. The contractor is required to submit any and all costs (including costs associated or required by all trades) along with performance differences as part of their request for substitution. The details of workmanship, finish and design, and the guaranteed performance of any material, apparatus or appliance which the Contractor desires to deviate for those mentioned herein shall also conform to these standards.
- C. Where no specific make of material, apparatus or appliance is mentioned, any first-class product made by a reputable manufacturer may be submitted for the Engineers review.
- D. Where one name only is used and is followed by the words “or approved equal”, the Contractor must use the item named or he is required to apply for a substitution. Where only one name is used, the Contractor must use that item named.

- E. Where two or more names are given as approved manufacturers of equivalents, the Contractor must use the specified item or one of the named equivalents which still must meet all of the performance characteristics of the basis of design make and model. Where one name only is used and is followed by the words “or approved equal”, the Contractor must use the item named or he is required to apply for a substitution. Where one name only is used, the Contractor must use that item named.
- F. Where the Contractor proposes to deviate (provide an equivalent or request for substitution) from the equipment or materials as hereinafter specified, they are required to submit a requested for substitution in writing. The Contractor shall state in their request whether it is a substitution or a non-approved equivalent to that specified and the amount of credit or extra cost involved. A copy of said request shall be included in the Base Bid with manufacturer’s equipment cuts. The Base Bid shall be based on using the materials and equipment as specified with no exceptions.
- G. Where the Contractor proposes to use an item of equipment other than specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign and all new drawings and detailing required therefore shall be prepared by the Engineers/Architects of Record at the expense of the Contractor and at no additional cost to the Owner.
- H. Where such accepted deviation resulting from using an approved equivalent or substitution requires a different quantity and arrangement of piping, ductwork, valves, pumps, insulation, wiring, conduit and equipment from that specified or indicated on the Drawings, the Contractor shall, after acceptance by the Engineer, furnish and install any such additional equipment required by the system at no additional cost to the Owner, including any costs added to other trades due to the deviation.
- I. Equipment, material or devices submitted for review as an “equivalent” shall meet the following requirements:
1. The equivalent shall have the same construction features such as, but not limited to:
 - a. Material thickness, gauge, weight, density, etc.
 - b. Welded, riveted, bolted, etc., construction
 - c. Finish, undercoating, corrosion protection
 2. The equivalent shall perform with the same or better operating efficiency.
 3. The equivalent shall be locally represented by the manufacturer for service, parts and technical information.
 4. The equivalent shall bear the same labels of performance certification as is applicable to the specified item, such as UL or NEMA labels.

- J. Equipment, material or devices submitted for review as a “substitution” shall meet the following requirements:
1. Substitution Request Submittal: Requests for substitution will be considered if received in writing 14 days before the bid date. Requests received later than 14 days before the bid date may be considered or rejected at the discretion of the Engineer/Owner. Once the Contractor submits a complete request for substitution as determined by the engineer, the engineer reserves the right to request the time necessary to evaluate the request for substitution and review it with the Owner.
 2. Submit three (3) copies of each request for substitution for consideration.
 3. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - d. 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 become necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
 - h. Engineer's Action: Within one week of receipt of the request for substitution, the Engineer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance of a product substitution will be in the form of an Addendum.
 - i. Other Conditions: The Contractor's substitution request will be received and considered by the Engineer when one or more of the following conditions are satisfied, as determined by the Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1) The request is directly related to an "or equal" clause or similar language in the Contract Documents.

- 2) The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
- 3) A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

1.10 SUBMITTAL PROCEDURES

- A. Provide Submittals in accordance with the requirements of Section 01 33 05 - Submittal Procedures and as indicated in the following.
- B. 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. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 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. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 3. Allow two weeks for reprocessing each submittal.
 4. 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.
- D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Submittals shall be arranged in order of specification sections.

1. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number, title and paragraph of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- F. Except for submittals for record, information or similar purposes, the Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
- G. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, to indicate the action taken.

1.11 SHOP DRAWINGS

- A. Submit neatly prepared information, drawn to accurate 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 considered Shop Drawings.
- B. The Contractor shall submit for review detailed shop drawings of all equipment and material specified in each section and coordinated ductwork layouts. No material or equipment may be delivered to the job site or installed until the Contractor has received shop drawings for the particular material or equipment which have been properly reviewed. Shop drawings shall be submitted within 60 days after award of Contract before any material or equipment is purchased. The Contractor shall submit for review copies of all shop drawings to be incorporated in the Mechanical Contract. Refer to Division 1 for the quantity of copies required for submission. Where quantities are not specified, provide seven (7) copies for review.
- C. Provide shop drawings for all devices specified under equipment specifications for all systems. Shop drawings shall include manufacturers' names, catalog numbers, cuts, diagrams, dimensions, identification of products and materials included, compliance with specified standards, notation of coordination requirements, notation of dimensions established by field measurement and other such descriptive data as may be required to identify and accept the equipment. A complete list in each category (example: all

fixtures), of all shop drawings, catalog cuts, material lists, etc., shall be submitted to the Engineer at one time. No consideration will be given to a partial shop drawing submittal.

- D. When a submittal could involve more than one trade, e.g., valves, piping, etc., the submitted shall be separated by traded involved, ie. HVAC, plumbing, fire protection, etc.
- E. Where multiple quantities or types of equipment are being submitted, provide a cover sheet (with a list of contents) on the submittal identifying the equipment or material being submitted.
- F. The Contractor shall furnish all necessary templates, patterns, etc., for installation work and for the purpose of making adjoining work conform; furnish setting plans and shop details to other trades as required.
- G. “No Exception Taken” rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, review does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the Contract Drawings and Specifications. Verify available space prior to submitting shop drawings. Review of shop drawings shall not apply to quantity of material.
- H. After shop drawings have been reviewed, with no exceptions taken, no further changes will be allowed without the written consent of the Engineer.
- I. Shop drawing submittal sheets which may show items that are not being furnished shall have those items crossed off to clearly indicate which items will be furnished.
- J. Bidders shall not rely on any verbal clarification of the Drawings and/or Specifications. Any questions shall be referred to the Engineer in writing at least five (5) working days prior to Bidding to allow for issuance of an Addendum.
- K. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- L. Prepare sheet metal and sprinkler shop drawings drawn in the latest Revit version to a minimum scale of 1/4" = 1'- 0". Final approved drawings shall be turned over to the Owner on Flash Drive or CD Rom.

1.12 COORDINATION DRAWINGS

- A. Prepare coordination drawings drawn in the latest Revit version in accordance with Division 1 to a minimum scale of 1/4"=1'-0" detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. The Contractor shall indicate the proposed locations of piping, conduit, ductwork, equipment, and materials. Include the following:

- a. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - b. Equipment connections and support details.
 - c. Exterior wall and foundation penetrations.
 - d. Fire-rated wall and floor penetrations.
 - e. Sizes and locations of required concrete pads and bases.
- B. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
- C. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
- D. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.
- E. The Contractor and each subcontractor shall sign and date each coordination drawing prior to submission.
- F. Work shall not be performed until coordination drawings have been approved by the architect and engineer.
- G. Electronic copies of the MEP floor plans are available to use as a basis for preparing coordination drawings and can be provided by the Engineer. If the Contractor elects to obtain the Engineers electronic files an Electronic Drawing File Release Form must be submitted. This form must be signed by the Contractor, Owner, and Architect. Upon receipt of a signed copy of the Electronic Drawing File Release Form, the Engineer will provide copies of the electronic files for the Contractor's use. A copy of the Electronic Drawing File Release Form is appended to the end of this specification section.

1.13 COORDINATION WITH OTHER DIVISIONS

- A. All work shall be carried out in conjunction with other trades and full cooperation shall be given in order that all work may proceed with a minimum of delay and interference. Particular emphasis is placed on timely installation of major apparatus and furnishing other Contractors, especially the Contractor or Construction Manager, with information as to openings, chases, sleeves, bases, inserts, equipment locations, panels, etc., required by other trades.
- B. The Contractors are required to examine all of the Project Drawings and mutually arrange work so as to avoid interference with the work of other trades. In general, ductwork, HVAC piping, sprinkler piping and drainage lines take precedence over water, gas and electrical conduits. The Engineer shall make final decisions regarding the arrangement of work which cannot be agreed upon by the Contractors.
- C. Where the work of the Contractor will be installed in close proximity to or will interfere with work of other trades, the Contractors will cooperate in working out space conditions to make a satisfactory adjustment.

- D. If the work under a Section is installed before coordinating with other Divisions or Sections or so as to cause interference with work of other Sections, the necessary changes to correct the condition shall be made by the Contractor causing the interference without extra charge to the Owner.

1.14 WORKMANSHIP

- A. Service Support: The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- B. Modification of References: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears.
- C. The Contractor shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of the work together with all skilled workmen, fitters, metal workers, welders, helpers and laborers required to unload, transfer, erect, connect, adjust, start, operate and test each system.
- D. Unless otherwise specifically indicated on the Drawings or Specifications, all equipment and materials shall be installed with the acceptance of the Engineer and in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.
- E. All labor for installation of plumbing systems shall be performed by experienced, skilled tradesmen under the supervision of a licensed journeyman foreman. All work shall be of a quality consistent with good trade practice and shall be installed in a neat, workmanlike manner. The Engineer reserves the right to reject any work which, in his opinion, has been installed in a substandard, dangerous or unserviceable manner. The Contractor shall replace said work in a satisfactory manner at no extra cost to the Owner.

1.15 SHUTDOWNS

- A. When installation of a new system requires the temporary shutdown of an existing operating system, the connection of the new system shall be performed at such time as designated by the Owner.
- B. The Engineer and the Owner shall be notified in writing of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance whenever possible. The Contractor shall provide all necessary labor, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.

1.16 TEMPORARY UTILITIES

- A. General: Provide new materials and equipment; if acceptable to the Engineer, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.
- C. First Aid Supplies: Comply with governing regulations.
- D. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
- E. Utilities: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.
- F. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
- G. Temporary Heat-Cool-Dehumidification: Provide temporary services required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate temporary services to produce the ambient condition required and minimize consumption of energy. The building's permanent HVAC systems shall not be used for these purposes.
- H. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- I. Termination and Removal: Unless the Engineer requires that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. Materials and facilities

that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

1.17 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Work under each Section shall include protecting the work and material of all other Sections from damage by work or workmen and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until the facility has been accepted by the Owner. Protect work against theft, injury or damage and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material.
- C. Work under each Section includes receiving, unloading, uncrating, storing, protecting, setting in place and completely connecting equipment supplied under each Section. Work under each Section shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt and/or damage by workmen or machinery. Insure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.18 ADJUSTING AND TESTING

- A. After all the equipment and accessories to be furnished are in place, they shall be put in final adjustment and subjected to such operating tests so as to assure the Engineer that they are in proper adjustment and in satisfactory, permanent operating condition.
- B. Where requested by the Engineer, a factory-trained service representative shall inspect the installation and assist in the initial startup and adjustment to the equipment. The period of these services shall be for such time as necessary to secure proper installation and adjustments. After the equipment is placed in permanent operation, the service representative shall supervise the initial operation of the equipment and instruct personnel responsible for operation and maintenance of the equipment. The service representative shall notify the Contractor in writing that the equipment was installed according to manufacturer's recommendations and is operating as intended by the manufacturer.

1.19 CLEANING

- A. Section 017423 - Final cleaning.
- B. The Contractor shall thoroughly clean and flush all piping and equipment of all foreign substances, oils, burrs, solder, flux, etc., inside and out before being placed in operation.

- C. If any part of a system should be stopped or damaged by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and/or remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected at no additional cost to the Owner.
- D. During the course of construction, all ducts and pipes shall be capped in an acceptable manner to insure adequate protection against the entrance of foreign matter.
- E. Upon completion of all work under the Contract, the Contractor shall remove from the premises all rubbish, debris and excess materials left over from his work. Any oil or grease stains on floor areas caused by the Contractor shall be removed and floor areas left clean.
- F. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - 1. Remove labels that are not permanent labels.
 - 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- G. 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 Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove and dispose of ALL waste materials, packaging material, skids etc. from the site and dispose of in a lawful manner in accordance with municipal, state and federal regulations.
- H. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

1.20 OPERATING AND MAINTENANCE

- A. Upon completion of all work and tests, the Contractor shall furnish the necessary skilled labor and helpers for operating his system and equipment for a period specified under each applicable Section of this Division. During this period, he shall fully instruct the Owner or the Owner's representative in the operation, adjustment and maintenance of all equipment furnished. The Contractor shall give at least seven (7) days notice to the Owner and the Engineer in advance of this period.
- B. The Contractor shall include the maintenance schedule for the principal items of equipment furnished under this Division.

- C. The Contractor shall physically demonstrate procedures for all routine maintenance of all equipment furnished under each respective Section to assure accessibility to all devices.
- D. An authorized manufacturer's representative shall attest in writing that the equipment has been properly installed prior to startup of any major equipment. The following equipment will require this inspection: pumps; controls, water heaters, compressors, boilers etc. These letters shall be bound into the operating and maintenance books.
- E. Refer to individual trade Sections for any other particular requirements related to operating instructions.
- F. Demonstration shall be recorded on (2) USB Flash drives turned over to the Owner.

1.21 OPERATING AND MAINTENANCE MANUALS

- A. Prepare operating and maintenance manuals in accordance with the requirements of Division 1 and as follows. The Contractor shall prepare six (6) copies of a complete maintenance and operating instructions manual, bound in booklet form. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 3-ring vinyl-covered binders, with pocket folders for folded sheet information and designation partitions with identification tabs. Mark appropriate identification on front and spine of each binder.
- B. Manual shall include the following:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing and operating instructions including lubrication charts and schedules.
 - 5. Emergency and safety instructions.
 - 6. Spare parts list.
 - 7. Copies of warranties.
 - 8. Wiring diagrams.
 - 9. Recommended "turn around" cycles.
 - 10. Inspection procedures.
 - 11. Approved Shop Drawings and Product Data.
 - 12. Equipment Start-up Reports.
 - 13. Temperature control diagrams and written sequences of operations.
 - 14. Balance reports.
- C. Include in the manual, a tabulated equipment schedule for all equipment. Schedule shall include pertinent data such as: make, model number, serial number, voltage, normal operating current, belt size, filter quantities and sizes, bearing number, etc. Schedule shall include maintenance to be done and frequency.

- D. Maintenance and instruction manuals shall be submitted to the Owner at the same time as the seven (7) day notice is given prior to the instruction period.

1.22 ACCEPTANCES

- A. The equipment, materials, workmanship, design and arrangement of all work installed under the Plumbing Sections shall be subject to the review of the Engineer.
- B. Within 30 days after the awarding of a Contract, the Plumbing Contractor shall submit to the Engineer, for review, a list of manufacturers of equipment proposed for the work under the Plumbing Sections. The intent to use the exact manufacturers and models specified does not relieve the Contractor of the responsibility of submitting such a list.
- C. If extensive or unacceptable delivery time is expected on a particular item of equipment specified, the Contractor shall notify the Owner and Engineer, in writing, within 30 days of award of the Contract. In such instances, equipment substitutions may be made pending acceptance by the Engineer or the Owner's representative.
- D. Where any specific material, process or method of construction or manufactured article is specified by reference to the catalog number of a manufacturer, the Specifications are to be used as a guide and are not intended to take precedence over the basic duty and performance specified or noted on the Drawings. In all cases, the Plumbing Contractor shall verify the duty specified with the specific characteristics of the equipment offered for review. Equipment characteristics are to be used as mandatory requirements where the Contractor proposes to use an acceptable equivalent.
- E. If material or equipment is installed before it is reviewed and/or approved, the Contractor shall be liable for its removal and replacement at no extra charge to the Owner if, in the opinion of the Engineer, the material or equipment does not meet the intent of, or standard of quality implied by, the Drawings and Specifications.
- F. Failure on the part of the Engineer to reject shop drawings or to reject work in progress shall not be interpreted as acceptance of work not in conformance with the Drawings and/or Specifications. Work not in conformance with the Drawings and/or Specifications shall be corrected whenever it is discovered.

1.23 RECORD DRAWINGS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.
- B. Maintain a clean, 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 whichever drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Items to be indicated include but are not limited to:
 - 1. Dimensional change
 - 2. Revision to drawing detail
 - 3. Location and depth of underground utility

4. Revision to pipe routing
 5. Revision to electrical circuitry
 6. Actual equipment location
 7. Pipe size and routing
 8. Location of concealed internal utility
 9. Changes made by Change Order
 10. Details not on original Contract Drawing
 11. Information on concealed elements which would be difficult to identify or measure later
- C. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
- D. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
- E. Note related Change Order numbers where applicable.
- F. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- G. Final record documents shall be prepared in the latest Revit version and CD Rom of all drawings and a clean set of reproducible paper copies shall be turned over to the Owner at the completion of the work.

1.24 WARRANTIES AND BONDS

- A. Section 01 40 00 - Quality Requirements, Section 01 73 00 - Execution and Section 017700 Closeout Procedures.
- B. The following general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties are to be included:
1. General close-out requirements included in Division 1.
 2. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of Divisions-2 through -50.
 3. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- D. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

1.25 WARRANTY REQUIREMENTS

- A. **Related Damages and Losses:** When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. **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.
- C. **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 Contract Documents. The 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.
- D. **Owner's Recourse:** Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, right and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- E. **Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer'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 Engineer.
- H. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.
- I. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - 1. Refer to individual Sections of Divisions-2 through -50 for specific content requirements, and particular requirements for submittal of special warranties.
- J. **Form of Submittal:** At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor,

supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

- K. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.
 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.26 GUARANTEES

- A. The Contractor shall guarantee all material and workmanship under these Specifications and the Contract for a period of one (1) year from the date of final acceptance by Owner. During this guarantee period, all defects developing through faulty equipment, materials or workmanship shall be corrected or replaced immediately by this Contractor without expense to the Owner. Such repairs or replacements shall be made to the Engineer's satisfaction.
- B. Contractor shall provide name, address, and phone number of all contractors and subcontractors and associated equipment they provided.

1.27 PROJECT CLOSE-OUT

- A. Section 01 40 00 - Quality Requirements, Section 01 73 00 - Execution and Section 017700 Closeout Procedures
- B. Contractor shall submit annual maintenance proposal to the Architect/Engineer for review and approval as part of the close out documents.
- C. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents in accordance with Division 1.
- D. Deliver tools, spare parts, extra stock, and similar items.
- E. Complete start-up testing of systems, including measuring and documenting all required startup checklist requirements documented in installation and maintenance instructions by the equipment manufacturer, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- F. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

- G. Field Observation Procedures: On receipt of a request for an Engineers Field Observation, the Engineer will advise the Contractor of unfulfilled requirements. The Engineer will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Engineer will repeat the Field Observation when requested and assured that the Work has been substantially completed.
 2. Results of the completed list of unfulfilled items will form the basis of requirements for final acceptance.

END OF SECTION 22 0400

Electronic Drawing File Release Form

DELIVERY OF ELECTRONIC FILES FOR:

Project Name

In accepting and utilizing any drawings or other data on any form of electronic media generated and provided by the Design Professional, the Client covenants and agrees that all such drawings and data are instruments of service of the Design Professional, who shall be deemed the author of the drawings and data, and shall retain all common law, statutory law and other rights, including copyrights.

The Client further agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this Agreement. The Client agrees to waive all claims against the Design Professional resulting in any way from any unauthorized changes or reuse of the drawings and data for any other project by anyone other than the Design Professional.

In addition, the Client agrees, to the fullest extent permitted by law, to indemnify and hold the Design Professional harmless from any damage, liability or cost, including reasonable attorneys' fees and costs of defense, arising from any changes made by anyone other than the Design Professional or from any reuse of the drawings and data without the prior written consent of the Design Professional.

Under no circumstances shall transfer of the drawings and other instruments of service on electronic media for use by the Client be deemed a sale by the Design Professional, and the Design Professional makes no warranties, either express or implied, of merchantability and fitness for any particular purpose.

Client's Signature

Date

Company - Title

Architects' Signature

Date

Firm - Title

Owner's Signature

Date

Company - Title

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SECTION 23 0400 - GENERAL CONDITIONS FOR MECHANICAL TRADES

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This section applies to certain sections of Division 26, "Electrical," and this section applies to all sections of Division 23, "Mechanical" of this project specification unless specified otherwise in the individual sections.
- C. The Drawings of other trades (Architectural, Food Service, Structural, Landscape, Civil, Mechanical, Fire Protection and Plumbing) shall be examined for coordination and familiarity of work with other Contractors. Any duplication or omission of provisions in this project should be brought to the attention of the Owners prior to Bidding.

1.2 DESCRIPTION

- A. The General Conditions and Supplementary General Conditions are a part of this Division and are to be considered a part of this Contract.
- B. Where items of the General Conditions and Supplementary General Conditions are repeated in other Sections of the Specifications, it is merely intended to qualify or to call particular attention to them. It is not intended that any other parts of the General Conditions and Supplementary General Conditions shall be assumed to be omitted if not repeated therein. This Section applies equally and specifically to all Contractors supplying labor and/or equipment and/or materials as required under each Section of this Division. Where conflicts exist between the drawings and the specifications or between this section of the specifications and other sections, the more stringent or higher cost option shall apply.

1.3 INTENT

- A. It is the intent of the Specifications and Drawings to call for finished work, tested and ready for operation.
- B. Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation as determined by good trade practice even if not particularly specified, shall be furnished, delivered and installed under their respective Divisions without any additional expense to the Owner.
- C. Minor details not usually shown or specified but necessary for proper installation and operation shall be included in the work as though they were hereinafter shown or specified.
- D. Work under each Section shall include giving written notice to the Owner and Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws,

ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, it is mutually agreed that work under each Section includes the cost of all required items for the accepted, satisfactory functioning of the entire system without extra compensation.

1.4 DEFINITIONS

- A. No Exceptions Taken – reviewed and determined to be in general conformance with contract documents.
- B. “Approved equal” mean any product which in the opinion of the Engineer is equal in quality, arrangement, appearance, and performance to the product specified.
- C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.
- D. “Finished” refers to all rooms and areas to be specified to receive architectural treatment as indicated on the drawings. All rooms and areas not covered, including underground tunnels and areas above ceilings shall be considered not finished, unless otherwise noted.
- E. “Furnish” or “supply” shall mean purchase, deliver to, and off-load at the job site, ready to be installed including where appropriate all necessary interim storage and protection.
- F. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- G. “Install” shall mean set in place complete with all mounting facilities and connections as necessary ready for normal use or service.
- H. “Product” shall mean any item of equipment, material, fixture, apparatus, appliance or accessory installed under this Division.
- I. “Provide” shall mean furnish (or supply) and install as necessary.
- J. Regulation: 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.
- K. Remove: The term “remove” means “to disconnect from its present position, remove from the premises and to dispose of in a legal manner.”
- L. Special Warranties: The term “Special Warranties” are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

- M. Standard Product Warranties: The term “Standard Product Warranties” are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- N. “Subcontractor” means specifically the subcontractor working under this Division. Other Contractors are specifically designated “Plumbing Subcontractor”, “General Contractor” and so on. Note: Take care to ascertain limits of responsibility for connecting equipment which requires connections by two or more trades.
- O. Substitutions: Requests for changes in products, materials, equipment, and methods of construction proposed by the Contractor are considered requests for "substitutions."
- P. “Wiring” shall mean cable assembly, raceway, conductors, fittings and any other necessary accessories to make a complete wiring system.

1.5 DRAWINGS

- A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the Contract. Consult the Architectural Drawings and Details for exact location of fixtures and equipment; where same are not definitely located, obtain this information from the Architect. (Do not scale the drawings)
- B. Work under each Section shall closely follow Drawings in layout of work; check Drawings of other Divisions to verify spaces in which work will be installed. Maintain maximum headroom; where space conditions appear inadequate, Owner and Engineer shall be notified before proceeding with installations.
- C. The Owner may, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades and/or for proper execution of the work.
- D. Where variances occur between the Drawings and Specifications or within either of the Documents, the item or arrangement of better quality, shall be included in the Contract price. The Owner and Engineer shall decide on the item and the manner in which the work shall be installed.

1.6 SURVEYS AND MEASUREMENTS

- A. Before submitting his Bid, the Contractors shall visit the site and become thoroughly familiar with all existing conditions under which work will be installed. This Contract includes all modifications of existing systems required for the installation of new equipment. This Contract includes all necessary offsets, transitions and modifications required to install all new equipment in existing spaces. All new and existing equipment and systems shall be fully operational under this Contract before the job is considered complete. The Contractors shall be held responsible for any assumptions he makes, any omissions or errors he makes as a result of his failure to become fully familiar with the existing conditions at the site and the Contract Documents.

- B. The Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.
- C. Should the Contractor discover any discrepancies between actual measurements and those indicated which prevent following good practice or which interfere with the intent of the Drawings and Specifications, the Engineer will be notified and work will not proceed until instructions from the Engineer are received.

1.7 CODES AND STANDARDS

- A. Reference Standard Compliance
 - 1. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
 - 2. Independent Testing Organization Certificate: In lieu of the label or listing indicated above, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- B. The Following Codes and Standards for the state and local jurisdiction where the project is located as listed below apply to all mechanical work. Wherever Codes and/or Standards are mentioned in these Specifications, the latest applicable edition or revision shall be followed:
 - Connecticut School Construction Standards and Guidelines Building Standards Guidelines – Compliance for High Performance Buildings
 - The International Building Code
 - The International Mechanical Code
 - The International Plumbing Code
 - The International Energy Conservation Code
 - The National Electrical Code
 - NFPA edition as referenced by local building code
 - ASHRAE 90.1 and International Energy Conservation Code

C. The following Standards shall be used where referenced by the following abbreviations:

AABC	Associated Air Balance Council
ACGIH	American Conference of Governmental Industrial Hygienists
ADC	Air Diffusion Council
AGA	American Gas Association
AIA	American Institute of Architects
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CGA	Compressed Gas Association
CSA	Canadian Standards Association
CISPI	Cast Iron Soil Pipe Institute
EJMA	Expansion Joint Manufacturing Association
EPA	Environmental Protection Agency
FM	Factory Mutual
FSSC	Federal Specification
HIS	Hydraulic Institute Standards
IEEE	Institute of Electrical and Electronics Engineers
IRI	Industrial Risk Insurers
ISO	Insurance Services Office
MCAA	Mechanical Contractors Association of America

NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NOFI	National Oil Fuel Institute
NSC	National Safety Council
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
PDI	Plumbing and Drainage Institute
SBI	Steel Boiler Industry (Division of Hydronics Institute)
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
STI	Steel Tank Institute
UL	Underwriters' Laboratories

- D. All materials furnished and all work installed shall comply with the rules and recommendations of the NFPA, the requirements of the local utility companies, the recommendations of the fire insurance rating organization having jurisdiction and the requirements of all Governmental departments having jurisdiction.
- E. The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and Drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether shown on Drawings and/or specified or not.

1.8 PERMITS AND FEES

- A. The Contractor shall give all necessary notices, obtain all permits; and pay all Government and State sales taxes and fees where applicable, and other costs, including utility connections or extensions in connection with the work, file all necessary Drawings, prepare all documents and obtain all necessary approvals of all Governmental and State departments having jurisdiction, obtain all required certificates of inspection for his work, and deliver a copy to the Owner and Engineer before request for acceptance and final payment for the work.

1.9 EQUIPMENT EQUIVALENTS AND SUBSTITUTIONS

- A. Certain manufacturers of material, apparatus or appliances are indicated in the drawings and specifications for this project. These items have been used as the basis of design, and as a convenience in fixing the minimum standard of workmanship, finish and design that is required. If the Contractors uses an "approved equal" alternative to the basis of design, and if the features of that alternative have an impact on other components of the Project, the Contractor shall include the necessary adjustments in those components, whether for

architectural, structural, mechanical, electrical, fire protection, or any other elements, plus any adjustments for difference in performance.

- B. Where one name only is used and is followed by the words “or approved equal”, the Contractor must use the item named or he is required to apply for a substitution. Where one name only is used, the Contractor must use that item named.
- C. Where no specific make of material, apparatus or appliance is mentioned, any first-class product made by a reputable manufacturer may be submitted for Architect and Engineer review.
- D. Where the Contractor proposes to use an item that is different from the basis of design in the Drawings and specifications, and that will require the redesign of the structure, partitions, foundations, piping, wiring or any other component of the mechanical, electrical, or architectural layout, the Contractor shall provide the necessary redesign of those components.
- E. Where the Contractor proposes to deviate (provide an equivalent or request for substitution) from the basis of design scheduled equipment or materials as hereinafter specified or shown on the drawings, they are required to submit a requested for substitution in writing. The Contractor shall state in their request whether it is a substitution, equivalent or a non approved equivalent to that specified and the amount of credit or extra cost involved. A copy of said request shall be included in the Base Bid with manufacturer’s equipment cuts. The Base Bid shall be based on using the materials and equipment as specified with no exceptions.
- F. If an alternative or substitute item results in a difference in quantity and arrangement of piping, ductwork, valves, pumps, insulation, wiring, conduit, and equipment from that specified or indicated on the Drawings, the Contractor shall furnish and install any such additional equipment required by the system, at no additional cost to the Owner including any costs added to other trades due to the equivalent change from the basis of design detailed in the drawings or included within the specifications.
- G. Equipment, material or devices submitted for review as an “equivalent” shall meet the following requirements:
 - 1. The equivalent shall have the same construction features such as, but not limited to:
 - a. Material thickness, gauge, weight, density, etc.
 - b. Welded, riveted, bolted, etc., construction
 - c. Finish, undercoating, corrosion protection
 - 2. The equivalent shall perform with the same or better operating efficiency.
 - 3. The equivalent shall be locally represented by the manufacturer for service, parts and technical information.
 - 4. The equivalent shall bear the same labels of performance certification as is applicable to the specified item, such as UL or NEMA labels.
- H. Equipment, material or devices submitted for review as a “substitution” shall meet the following requirements:
 - 1. Substitution Request Submittal: Requests for substitution will be considered if received in writing 14 days before the bid date. Requests received later than 14

days before the bid date may be considered or rejected at the discretion of the Engineer/Owner. Once the Contractor submits a complete request for substitution as determined by the engineer, the engineer reserves the right to request the time necessary to evaluate the request for substitution and review it with the Owner.

2. Submit three (3) copies of each request for substitution for consideration.
3. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - d. 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 become necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
 - h. Engineer's Action: Within one week of receipt of the request for substitution, the Engineer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance of a product substitution will be in the form of an Addendum.
 - i. Other Conditions: The Contractor's substitution request will be received and considered by the Engineer when one or more of the following conditions are satisfied, as determined by the Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1) The request is directly related to an "or equal" clause or similar language in the Contract Documents.
 - 2) The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a

result of failure to pursue the Work promptly or coordinate activities properly.

- 3) A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

1.10 SUBMITTAL PROCEDURES

- A. Provide Submittals in accordance with the requirements of Division 1 and as indicated in the following.
- B. 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. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 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. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 3. Allow two weeks for reprocessing each submittal.
 4. 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.
- D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Submittals shall be arranged in order of specification sections.
 1. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.

- g. Name of manufacturer.
 - h. Number, title and paragraph of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- F. Except for submittals for record, information or similar purposes, the Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
- G. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, to indicate the action taken.

1.11 SHOP DRAWINGS

- A. Submit neatly prepared information, drawn to accurate 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 considered Shop Drawings.
- B. The Contractor shall submit for review detailed shop drawings of all equipment and material specified in each section and coordinated ductwork layouts. No material or equipment may be delivered to the job site or installed until the Contractor has received shop drawings for the particular material or equipment which have been properly reviewed. Shop drawings shall be submitted within 60 days after award of Contract before any material or equipment is purchased. The Contractor shall submit for review copies of all shop drawings to be incorporated in the Mechanical Contract. Refer to Division 1 for the quantity of copies required for submission. Where quantities are not specified, provide seven (7) copies for review.
- C. Provide shop drawings for all devices specified under equipment specifications for all systems. Shop drawings shall include manufacturers' names, catalog numbers, cuts, diagrams, dimensions, identification of products and materials included, compliance with specified standards, notation of coordination requirements, notation of dimensions established by field measurement and other such descriptive data as may be required to identify and accept the equipment. A complete list in each category (example: all fixtures), of all shop drawings, catalog cuts, material lists, etc., shall be submitted to the Engineer at one time. No consideration will be given to a partial shop drawing submittal.
- D. When a submittal could involve more than one trade, e.g., valves, piping, etc., the submitted shall be separated by traded involved, ie. HVAC, plumbing, fire protection, etc.

- E. Where multiple quantities or types of equipment are being submitted, provide a cover sheet (with a list of contents) on the submittal identifying the equipment or material being submitted.
- F. The Contractor shall furnish all necessary templates, patterns, etc., for installation work and for the purpose of making adjoining work conform; furnish setting plans and shop details to other trades as required.
- G. “No Exception Taken” rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, review does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the Contract Drawings and Specifications. Verify available space prior to submitting shop drawings. Review of shop drawings shall not apply to quantity of material.
- H. After shop drawings have been reviewed, with no exceptions taken, no further changes will be allowed without the written consent of the Engineer.
- I. Shop drawing submittal sheets which may show items that are not being furnished shall have those items crossed off to clearly indicate which items will be furnished.
- J. Bidders shall not rely on any verbal clarification of the Drawings and/or Specifications. Any questions shall be referred to the Engineer in writing at least five (5) working days prior to Bidding to allow for issuance of an Addendum.
- K. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- L. Prepare sheetmetal and sprinkler shop drawings drawn in the latest Revit version at 1 to 1 (full) scale and submit hard copy print plotted at $\frac{1}{4}'' = 1' - 0''$. Final approved drawings shall be turned over to the Owner on USB flash drive.

1.12 COORDINATION DRAWINGS

- A. Prepare coordination drawings drawn in the latest Revit version in accordance with Division 1, at 1 to 1 (full) scale and submit hard copy plotted at $\frac{1}{4}'' = 1' - 0''$ detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. The Contractor shall indicate the proposed locations of piping, conduit, ductwork, equipment, and materials. Include the following:
 - a. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - b. Equipment connections and support details.
 - c. Exterior wall and foundation penetrations.
 - d. Fire-rated wall and floor penetrations.

- e. Sizes and locations of required concrete pads and bases.
- B. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
- C. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
- D. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.
- E. The Contractor and each subcontractor shall sign and date each coordination drawing prior to submission.
- F. Work shall not be performed until coordination drawings have been approved by the architect and engineer.
- G. Electronic copies of the MEP floor plans are available to use as a basis for preparing coordination drawings and can be provided by the Engineer. If the Contractor elects to obtain the Engineers electronic files an Electronic Drawing File Release Form must be submitted with payment. This form must be signed by the Contractor, Owner, and Architect. Upon receipt of a signed copy of the Electronic Drawing File Release Form, and payment, the Engineer will provide copies of the electronic files for the Contractor's use. A copy of the Electronic Drawing File Release Form is appended to the end of this specification section

1.13 COORDINATION WITH OTHER DIVISIONS

- A. All work shall be carried out in conjunction with other trades and full cooperation shall be given in order that all work may proceed with a minimum of delay and interference. Particular emphasis is placed on timely installation of major apparatus and furnishing other Contractors, especially the Contractor or Construction Manager, with information as to openings, chases, sleeves, bases, inserts, equipment locations, panels, etc., required by other trades.
- B. The Contractors are required to examine all of the Project Drawings and mutually arrange work so as to avoid interference with the work of other trades. In general, ductwork, HVAC piping, sprinkler piping and drainage lines take precedence over water, gas and electrical conduits. The Engineer shall make final decisions regarding the arrangement of work which cannot be agreed upon by the Contractors.
- C. Where the work of the Contractor will be installed in close proximity to or will interfere with work of other trades, the Contractors will cooperate in working out space conditions to make a satisfactory adjustment.
- D. If the work under a Section is installed before coordinating with other Divisions or Sections or so as to cause interference with work of other Sections, the necessary changes to correct the condition shall be made by the Contractor causing the interference without extra charge to the Owner.

1.14 WORKMANSHIP

- A. Service Support: The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- B. Modification of References: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears.
- C. The Contractor shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of the work together with all skilled workmen, fitters, metal workers, welders, helpers and laborers required to unload, transfer, erect, connect, adjust, start, operate and test each system.
- D. Unless otherwise specifically indicated on the Drawings or Specifications, all equipment and materials shall be installed with the acceptance of the Engineer and in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.
- E. All labor for installation of mechanical systems shall be performed by experienced, skilled tradesmen under the supervision of a licensed journeyman foreman. All work shall be of a quality consistent with good trade practice and shall be installed in a neat, workmanlike manner. The Engineer reserves the right to reject any work which, in his opinion, has been installed in a substandard, dangerous or unserviceable manner. The Contractor shall replace said work in a satisfactory manner at no extra cost to the Owner.

1.15 SHUTDOWNS

- A. When installation of a new system requires the temporary shutdown of an existing operating system, the connection of the new system shall be performed at such time as designated by the Owner.
- B. The Engineer and the Owner shall be notified in writing of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance whenever possible. The Contractor shall provide all necessary labor, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.

1.16 TEMPORARY UTILITIES

- A. General: Provide new materials and equipment; if acceptable to the Engineer, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not

overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

- C. First Aid Supplies: Comply with governing regulations.
- D. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
- E. Utilities: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.
- F. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
- G. Temporary Heat-Cool-Dehumidification: Provide temporary services required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate temporary services to produce the ambient condition required and minimize consumption of energy. The building's permanent HVAC systems shall not be used for these purposes.
- H. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- I. Termination and Removal: Unless the Engineer requires that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

1.17 BUILDING FLUSH-OUT

- A. Building flush-out shall begin after construction ends and finishes are installed but prior to building occupancy. Prior to building flush-out, HVAC systems shall be balanced per Specification Section 23 05 93. Flush-out shall not occur until contractor receives

permission to proceed from the Owner or Owner's representative. Flush-out shall continue during the first weeks of occupancy as scheduled below.

- B. Building flush-out procedures shall include continuously operating all the building's new ventilation systems at maximum design outside air flow rates. For constant volume HVAC systems, ventilation systems shall operate at maximum design supply air flow rates. For VAV systems, supply air flow shall be allowed to vary to maintain space temperatures. HVAC systems shall be set to maintain internal space temperatures at minimum 60°F and maximum 78°F and relative humidity at maximum 60% RH.
- C. Building flush-out prior to occupancy: HVAC systems shall operate continuously, 24 hours per day, for a minimum period of 12 days. Commissioning and testing of the HVAC systems' temperature controls shall be allowed during this time frame.
- D. Building flush-out at start of occupancy: HVAC systems shall operate continuously, 24 hours per day, for a minimum period of 40 days.

1.18 PROJECT PHASING

- A. Work under each Section shall include all necessary temporary connections, equipment, piping, heating, temperature control work, fire stopping, water heaters, labor, and material as necessary to accommodate the phasing of Construction as developed by the General Contractor or Construction Manager and approved by the Owner. All existing systems that pass-thru an area of the building shall remain operational during all phases of construction. No extra compensation shall be granted the Contractor for work required to maintain existing systems operational or to accommodate the construction phasing of the project.

1.19 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Work under each Section shall include protecting the work and material of all other Sections from damage by work or workmen and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until the facility has been accepted by the Owner. Protect work against theft, injury or damage and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material.
- C. Work under each Section includes receiving, unloading, uncrating, storing, protecting, setting in place and completely connecting equipment supplied under each Section. Work under each Section shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt and/or damage by workmen or machinery. Insure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.20 ADJUSTING AND TESTING

- A. After all the equipment and accessories to be furnished are in place, they shall be put in final adjustment and subjected to such operating tests so as to assure the Engineer that they are in proper adjustment and in satisfactory, permanent operating condition.
- B. Where requested by the Engineer, a factory-trained service representative shall inspect the installation and assist in the initial startup and adjustment to the equipment. The period of these services shall be for such time as necessary to secure proper installation and adjustments. After the equipment is placed in permanent operation, the service representative shall supervise the initial operation of the equipment and instruct personnel responsible for operation and maintenance of the equipment. The service representative shall notify the Contractor in writing that the equipment was installed according to manufacturer's recommendations and is operating as intended by the manufacturer.

1.21 CLEANING

- A. The Contractor shall thoroughly clean and flush all piping, ducts and equipment of all foreign substances, oils, burrs, solder, flux, etc., inside and out before being placed in operation.
- B. If any part of a system should be stopped or damaged by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and/or remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected at no additional cost to the Owner.
- C. During the course of construction, all ducts and pipes shall be capped in an acceptable manner to insure adequate protection against the entrance of foreign matter.
- D. Upon completion of all work under the Contract, the Contractor shall remove from the premises all rubbish, debris and excess materials left over from his work. Any oil or grease stains on floor areas caused by the Contractor shall be removed and floor areas left clean.
- E. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - 1. Remove labels that are not permanent labels.
 - 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

- F. 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 Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove and dispose of ALL waste materials, packaging material, skids etc. from the site and dispose of in a lawful manner in accordance with municipal, state and federal regulations.
- G. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

1.22 OPERATING AND MAINTENANCE

- A. Upon completion of all work and tests, the Contractor shall furnish the necessary skilled labor and helpers for operating his system and equipment for a period specified under each applicable Section of this Division. During this period, he shall fully instruct the Owner or the Owner's representative in the operation, adjustment and maintenance of all equipment furnished. The Contractor shall give at least seven (7) days notice to the Owner and the Engineer in advance of this period.
- B. The Contractor shall include the maintenance schedule for the principal items of equipment furnished under this Division.
- C. The Contractor shall physically demonstrate procedures for all routine maintenance of all equipment furnished under each respective Section to assure accessibility to all devices.
- D. An authorized manufacturer's representative shall attest in writing that the equipment has been properly installed prior to startup of any major equipment. The following equipment will require this inspection: pumps; air conditioning equipment, controls, air handling equipment, compressors, boilers etc. These letters shall be bound into the operating and maintenance books.
- E. Refer to individual trade Sections for any other particular requirements related to operating instructions.
- F. Demonstration shall be recorded on USB Flash drive turned over to the Owner.

1.23 OPERATING AND MAINTENANCE MANUALS

- A. Prepare operating and maintenance manuals in accordance with the requirements of Division 1 and as follows. The Contractor shall prepare six (6) copies of a complete maintenance and operating instructions manual, bound in booklet form. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 3-ring vinyl-covered binders, with pocket folders for folded sheet information and designation partitions with identification tabs. Mark appropriate identification on front and spine of each binder.
- B. Manual shall include the following:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing and operating instructions including lubrication charts and schedules.
 5. Emergency and safety instructions.
 6. Spare parts list.
 7. Copies of warranties.
 8. Wiring diagrams.
 9. Recommended "turn around" cycles.
 10. Inspection procedures.
 11. Approved Shop Drawings and Product Data.
 12. Equipment Start-up Reports.
 13. Temperature control diagrams and written sequences of operations.
 14. Balance reports.
- C. Include in the manual, a tabulated equipment schedule for all equipment. Schedule shall include pertinent data such as: make, model number, serial number, voltage, normal operating current, belt size, filter quantities and sizes, bearing number, etc. Schedule shall include maintenance to be done and frequency.
- D. Maintenance and instruction manuals shall be submitted to the Owner at the same time as the seven (7) day notice is given prior to the instruction period.

1.24 ACCEPTANCES

- A. The equipment, materials, workmanship, design and arrangement of all work installed under the Mechanical Sections shall be subject to the review of the Engineer.
- B. Within 30 days after the awarding of a Contract, the Mechanical Contractor shall submit to the Engineer, for review, a list of manufacturers of equipment proposed for the work under the Mechanical Sections. The intent to use the exact manufacturers and models specified does not relieve the Contractor of the responsibility of submitting such a list.
- C. If extensive or unacceptable delivery time is expected on a particular item of equipment specified, the Contractor shall notify the Owner and Engineer, in writing, within 30 days of award of the Contract. In such instances, equipment substitutions may be made pending acceptance by the Engineer or the Owner's representative.
- D. Where any specific material, process or method of construction or manufactured article is specified by reference to the catalog number of a manufacturer, the Specifications are to be used as a guide and are not intended to take precedence over the basic duty and performance specified or noted on the Drawings. In all cases, the Mechanical Contractor shall verify the duty specified with the specific characteristics of the equipment offered for review. Equipment characteristics are to be used as mandatory requirements where the Contractor proposes to use an acceptable equivalent.

- E. If material or equipment is installed before it is reviewed and/or approved, the Contractor shall be liable for its removal and replacement at no extra charge to the Owner if, in the opinion of the Engineer, the material or equipment does not meet the intent of, or standard of quality implied by, the Drawings and Specifications.
- F. Failure on the part of the Engineer to reject shop drawings or to reject work in progress shall not be interpreted as acceptance of work not in conformance with the Drawings and/or Specifications. Work not in conformance with the Drawings and/or Specifications shall be corrected whenever it is discovered.

1.25 RECORD DRAWINGS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.
- B. Maintain a clean, 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 whichever drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Items to be indicated include but are not limited to:
 - 1. Dimensional change
 - 2. Revision to drawing detail
 - 3. Location and depth of underground utility
 - 4. Revision to pipe routing
 - 5. Revision to electrical circuitry
 - 6. Actual equipment location
 - 7. Duct size and routing
 - 8. Location of concealed internal utility
 - 9. Changes made by Change Order
 - 10. Details not on original Contract Drawing
 - 11. Information on concealed elements which would be difficult to identify or measure later
- C. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
- D. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
- E. Note related Change Order numbers where applicable.
- F. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- G. These shall be clearly marked for Record Drawings on a clean set of reproducible paper copies at the completion of the work and turned over to the Owner.

- H. Final record documents shall be prepared in the latest Revit version and on USB Flash drive of all drawings and a clean set of reproducible paper copies shall be turned over to the Owner at the completion of the work.

1.26 WARRANTIES AND BONDS

- A. The following general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties are to be included:
 - 1. General close-out requirements included in Division 1.
 - 2. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of Divisions-2 through -50.
 - 3. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

1.27 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. 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.
- C. 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 Contract Documents. The 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.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, right and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer'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 Engineer.
- H. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.
- I. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - 1. Refer to individual Sections of Divisions-1 through -50 for specific content requirements, and particular requirements for submittal of special warranties.
- J. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- K. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
 - 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.
 - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.28 GUARANTEES

- A. The Contractor shall guarantee all material and workmanship under these Specifications and the Contract for a period of one (1) year from the date of final acceptance by Owner. During this guarantee period, all defects developing through faulty equipment, materials or workmanship shall be corrected or replaced immediately by this Contractor without expense to the Owner. Such repairs or replacements shall be made to the Engineer's satisfaction.

- B. Contractor shall provide name, address, and phone number of all contractors and subcontractors and associated equipment they provided.

1.29 PROJECT CLOSE-OUT

- A. Section 01 40 00 - Quality Requirements, Section 01 73 00 - Execution and Section 017700 Closeout Procedures.
- B. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents in accordance with Division 1.
- C. Deliver tools, spare parts, extra stock, and similar items.
- D. Complete start-up testing of systems, including measuring and documenting all required startup checklist requirements documented in installation and maintenance instructions by the equipment manufacturer, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- E. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- F. Field Observation Procedures: On receipt of a request for an Engineers Field Observation, the Engineer will advise the Contractor of unfulfilled requirements. The Engineer will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Engineer will repeat the Field Observation when requested and assured that the Work has been substantially completed.
 - 2. Results of the completed list of unfulfilled items will form the basis of requirements for final acceptance.

END OF SECTION 23 0400

Electronic Drawing File Release Form

DELIVERY OF FILES FOR: _____

Project Name

In accepting and utilizing any drawings or other data on any form of electronic media generated and provided by the Design Professional, the Client covenants and agrees that all such drawings and data are instruments of service of the Design Professional, who shall be deemed the author of the drawings and data, and shall retain all common law, statutory law and other rights, including copyrights.

The Client further agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this Agreement. The Client agrees to waive all claims against the Design Professional resulting in any way from any unauthorized changes or reuse of the drawings and data for any other project by anyone other than the Design Professional.

In addition, the Client agrees, to the fullest extent permitted by law, to indemnify and hold the Design Professional harmless from any damage, liability or cost, including reasonable attorneys' fees and costs of defense, arising from any changes made by anyone other than the Design Professional or from any reuse of the drawings and data without the prior written consent of the Design Professional.

Under no circumstances shall transfer of the drawings and other instruments of service on electronic media for use by the Client be deemed a sale by the Design Professional, and the Design Professional makes no warranties, either express or implied, of merchantability and fitness for any particular purpose.

Client's Signature

Date

Company - Title

Architects' Signature

Date

Firm - Title

Owner's Signature

Date

Company - Title

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SECTION 230900 - DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. Section 230993 – Sequence of operations
 - 2. Section 23 04 00 – General Conditions for Mechanical Trades
 - 3. Division 26 - Electrical

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate mechanical system controlled and control system components.
 - 1. Label with settings, adjustable range of control and limits. Submit written description of control sequence.
 - 2. Submit flow diagrams for each control system, graphically depicting control logic.
 - 3. Submit draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of components and set points of controls, including changes to sequences made after submission of shop drawings.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 VARIABLE AIR SYSTEM - CONTROL SYSTEM DESCRIPTION

- A. Provide a new Air System Controller or Building Automation System (BAS) to integrate and control all mechanical equipment associated with the variable air system.
 - 1. The Building Automation System shall be as indicated on the drawings and described in these specifications. System must be fully integrated and coordinated with mechanical equipment DDC controllers furnished and installed in the equipment manufacturer's factory as specified in those sections. The intent of the BAS is to integrate all mechanical equipment into one system for global monitoring, control, and alarming associated with the building. It is the BAS manufacturer's responsibility to provide all the design, engineering, and field coordination required to ensure all equipment sequence of operations are met as specified and the designated BAS operators have the capability of managing the building mechanical system to ensure occupant comfort while maintaining energy efficiency.
 - 2. The BAS shall meet open standard protocol communication standards (As defined in System Communications Section) to ensure the system maintains "interoperability" to avoid proprietary arrangements that will make it difficult for the Owner to consider other BAS manufacturers in future projects.
 - 3. Direct Digital Control (DDC) technology shall be used to provide the functions necessary for control of mechanical systems and terminal devices on this project.
 - 4. The BAS shall accommodate simultaneous multiple user operation. Access to the control system data should be limited only by the security permissions of the operator role. Multiple users shall have access to all valid system data. An operator shall be able to log onto any workstation on the control system and have access to all appropriate data.

3.2 VARIABLE AIR SYSTEM - APPROVED CONTROL SYSTEM MANUFACTURES

- A. The following Building Automation System Manufactures are approved to provide controls systems for the Variable Air System project
 - 1. Trane Tracer® - Basis of Design
 - 2. Approved equal

3.3 VARIABLE AIR SYSTEM - COMMUNICATIONS

- A. System communications
1. Each workstation, building controller, and equipment/plant controller communication interface shall utilize the BACnet™ protocol with an Ethernet (IEEE 802.3, 802.11) or RS485 (EIA-485) physical interface and an appropriate data link technology as defined in ANSI®/ASHRAE® Standard 135-2012. (e.g. BACnet IP, BACnet IPv6, BACnet MS/TP).
 2. All system controllers shall be BTL listed as a BACnet Building Controller (B-BC) as defined in ANSI®/ASHRAE® Standard 135-2012.
 3. All documented status and control points, schedule, alarm, and data-log services or objects shall be available as standard object types as defined in ANSI®/ASHRAE® Standard 135-2012.
 4. Each System Controller shall communicate with a network of Custom Application and Application Specific Controllers utilizing one or more of the interfaces documented within Field Bus Communications below.
 5. For minimally managed IP networks, BACnet communication shall support BACnet Secure Connect (BACnet/SC), a secure and encrypted datalink layer specifically design for those networks.
- B. Field Bus Communications
1. BACnet
 - a. All equipment and plant controllers shall be BTL listed as a BACnet Application Specific Controller (B-ASC) or a BACnet Advanced Application Controller (B-AAC) as defined in ANSI®/ASHRAE® Standard 135-2012.
 - b. All communication shall conform to ANSI®/ASHRAE® Standard 135-2012.
 - c. System Controller shall function as a BACnet router to each unit controller providing a globally unique BACnet Device ID for all BACnet controllers within the system.
 - d. BACnet MS/TP
 - 1) Communication between System Controller and equipment/plant controllers shall utilize BACnet MS/TP as defined in ANSI®/ASHRAE® Standard 135-2012

3.4 VARIABLE AIR SYSTEM - OPERATOR INTERFACE

- A. Provide Operator Web Interface to allow system operators to view and adjust Variable Air System status, set-points and alarms.
1. Manufacturer shall provide a user interface with time-of-day schedules, data collection, dashboards, reports and building summary, system applications, and self-expiring timed overrides. Manufacturer shall provide a published user and applications guide(s) that detail the system application operation, configuration, setup and troubleshooting.
 2. The building operator web interface shall be accessible via a web browser without requiring any “plug-ins” (i.e. JAVA Runtime Environment (JRE), Adobe Flash).
 3. User Roles
 - a. The system shall include pre-defined “roles” that allow a system administrator to quickly assign permissions to a user.

- b. User logon/logoff attempts shall be recorded.
 - c. The system shall protect itself from unauthorized use by automatically logging off following the last keystroke. The delay time shall be user definable.
4. On-Line Help and Training
- a. Provide a context sensitive, on line help system to assist the operator in operation and configuration of the system.
 - b. On-line help shall be available for all system functions and shall provide the relevant data for each particular screen.
5. Equipment and Application Pages
- a. The operator web interface shall include standard pages for all equipment and applications. These pages shall allow an operator to obtain information relevant to the operation of the equipment and/or application, including:
 - 1) Animated Equipment Graphics for each major piece of equipment and floor plan in the System. This includes:
 - a) Each Chiller, Air Handler, VAV Terminal, Fan Coil, Boiler, and Cooling Tower. These graphics shall show all points dynamically as specified in the points list.
 - b) Animation capabilities shall include the ability to show a sequence of images reflecting the position of analog outputs, such as valve or damper positions. Graphics shall be capable of launching other web pages.
 - 2) Alarms relevant to the equipment or application without requiring a user to navigate to an alarm page and perform a filter.
 - 3) Historical Data (As defined in Data Log section below) for the equipment or application without requiring a user to navigate to a Data Log page and perform a filter.
6. Provide Variable Air System graphics: An operator shall be able to view and control (where applicable) the following parameters via the operator web interface:
- a. System Mode
 - b. System Occupancy
 - c. Ventilation (Outdoor air flow) setpoint
 - d. Ventilation (Outdoor air flow) status
 - e. Air Handler Static pressure setpoint
 - f. Air Handler Static pressure status
 - g. Air Handler Occupancy status
 - h. Air Handler Supply air cooling and heating set points
 - i. Air Handler minimum, maximum and nominal static pressure setpoints
 - j. VAV box minimum and maximum flow
 - k. VAV box drive open and close overrides
 - l. VAV box Airflow to space
 - m. Average space temperature
 - n. Minimum space temperature
 - o. Maximum space temperature
7. System Graphics. Building operator web interface shall be graphically based and shall include at least one graphic per piece of equipment or occupied zone, graphics for each chilled water and hot water system, and graphics that summarize conditions on each floor of each building included in this contract.

- Indicate thermal comfort on floor plan summary graphics using colors to represent zone temperature relative to zone set point.
- a. Graphic imagery – graphics shall use 3D images for all standard and custom graphics. The only allowable exceptions will be photo images, maps, schematic drawings, and selected floor plans.
 - b. Animation. Graphics shall be able to animate by displaying different Image lies for changed object status.
 - c. Alarm Indication. Indicate areas or equipment in an alarm condition using color or other visual indicator
8. Graphics Library. Furnish a library of standard HVAC equipment such as chillers, air handlers, terminals, fan coils, unit ventilators, rooftop units, and VAV boxes, in 3-dimensional graphic depictions. The library shall be furnished in a file format compatible with the graphics generation package program
9. Manual Control and Override.
- a. Point Control. Provide a method for a user to view, override, and edit if applicable, the status of any object and property in the system. The point status shall be available by menu, on graphics or through custom programs.
 - b. Temporary Overrides. The user shall be able to perform a temporary override wherever an override is allowed, automatically removing the override after a specified period of time.
 - c. Override Owners. The system shall convey to the user the owner of each override for all priorities that an override exists.
 - d. Provide a specific icon to show timed override or operator override, when a point, unit controller or application has been overridden manually.
10. Scheduling. - The scheduling application shall provide graphical representation of the day, week, month and exception events.
11. Alarm/Event Notification
- a. Alarm/Event Log. The operator shall be able to view all logged system alarms/events from any building operator web interface.
 - 1) The operator shall be able to sort and filter alarms from events. Alarms shall be sorted in a minimum of 4 categories based on severity.
 - 2) The operator shall be able to acknowledge and add comments to alarms
 - 3) Alarm/event messages shall use full language, easily recognized descriptors.
 - b. Alarm Suppression. Alarms shall be able to be suppressed based on load/source relationships to present the likely root cause to the building operator as described in ASHRAE Guideline 36. Load/Source relationships shall be configurable by the user through a web interface.
12. Reports and Logs.
- a. The building operator web interface shall provide a reporting package that allows the operator to select reports.
 - b. The building operator web interface shall provide the ability to schedule reports to run at specified intervals of time.
 - c. The following standard reports shall be available without requiring a user to manually configure the report:
 - 1) All Points in Override Report: Provide an on demand report showing all overrides in effect.

- 2) Commissioning Report: Provide a one-time report that lists all equipment with the unit configuration and present operation.
 - 3) All Points in Alarm Report: Provide an on demand report showing all current alarms.
 - 4) Points report: Provide a report that lists the current value of all points
 - d. The controls vendor shall provide a hardening report that summarizes the port configuration details to ensure sites have not been exposed to the Internet in alignment with Cyber Security best practices.
- B. Provide Mobile App Interface
1. Controls manufacturer shall provide a phone/tablet interface with the ability to view/override status and setpoints, view/change schedules, view/acknowledge/comment on alarms, and view graphics for all spaces and equipment. This phone/tablet interface shall resize itself appropriately for the size of the interface (i.e. no "pinching and zooming" required). This phone/tablet interface shall function remotely from the facility while following IT security best practices (e.g. no ports exposed to the internet).
 2. Provide mobile (smart phone or tablet) interfaces to the building automation system, compatible with iOS and Android operating systems.
 3. Controls manufacturer shall provide a phone/tablet interface with the ability to view/override status and setpoints, view/change schedules, view/acknowledge/comment on alarms, and view graphics for all spaces and equipment.
 4. This phone/tablet interface shall resize itself appropriately for the size of the interface (i.e. no "pinching and zooming" required).
 5. This phone/tablet interface shall function remotely from the facility while following IT security best practices (e.g. no ports exposed to the internet).
 6. The operator interface shall support system access on a mobile device via a mobile app to:
 - a. Alarm log
 - b. System Status
 - c. Equipment status
 - d. Space Status
 - e. Standard Equipment graphics
 - f. Override set points
 - g. Override occupancy
 - h. Acknowledge Alarms
 - i. Add Comment(s) to Alarms
- C. Provide Local Occupant Interface – Touch sensitive display
1. Provide a color touch sensitive display that allows the building occupants to accomplish the following tasks:
 - a. Occupant override of the system/equipment operating mode shall be possible with a single touch on the local operator display. With the ability to set up point overrides to expire at designated times
 - b. The local operator display shall provide occupant access to system time of day scheduling. Occupants shall have the ability to schedule events more than one year in advance. Exception schedules and holidays shall be shown clearly on the calendar, visible to the occupant on the touchscreen display.

- c. The local operator display shall offer PIN control, which shall limit system control access to only those with proper login credentials.
 - d. The local operator display shall display the alerts that require service of the connected equipment.
2. To ensure interoperability with the Building Automation System (BAS), the local operator display shall be provided by the BAS solution provider associated with this project.
 3. Local operator display shall be a minimum of 10 inches in size and be provided with mounting hardware to allow it to be installed on an office wall or control panel door.

3.5 VARIABLE AIR SYSTEM - BUILDING / SYSTEM CONTROLLERS

- A. There shall be one or more independent, standalone microprocessor based System Controllers to manage the global strategies described in CONTROLLER SOFTWARE section.
 1. The controller shall provide a USB communications port for connection to a PC.
 2. The operating system of the Controller shall manage the input and output communications signals to allow distributed controllers to share real and virtual point information and allow central monitoring and alarms.
 3. All System Controllers shall have a real time clock and shall be able to accept a BACnet time synchronization command for automatic time synchronization.
 4. Data shall be shared between networked System Controllers.
 5. Serviceability – The System Controller shall have a display on the main board that indicates the current operating mode of the controller.
- B. Controls manufacturer shall provide secure remote access to the Building Automation System (BAS). Secure remote access shall not require IP ports to be "exposed" (i.e. port-forwarded or external public IP addresses) to the Internet. Controls manufacturer shall update secure remote access software as necessary to follow cyber security best practices and respond to cyber security events.

3.6 VARIABLE AIR SYSTEM - CONTROLLER SOFTWARE

- A. Variable Air System Controls Manufacturer shall provide standard applications to deliver HVAC system control. Standard applications include Time of Day Scheduling with Optimal Start/Stop, VAV Air Systems Control, Chiller Plant Control, Historical Trend Logs and Trim and Respond. Manufacturer shall provide system optimization strategies for functions such as fan pressure optimization and ventilation optimization.
- B. Furnish the following applications software for building and energy management. All software applications shall reside and run in the system controllers. Editing of applications shall occur at the building operator interface.
 1. VAV Air Systems Applications
 - a. The BAS shall provide air system applications that coordinate air handlers (AHU)/rooftop units (RTU) and Variable Air Volume Terminal equipment.
 - b. The air system applications shall perform the following functions:
 - 1) Startup and shutdown the air handler safely. Ensure the VAV boxes are open sufficiently when the air handler is running, to

- prevent damage to the ductwork and VAV boxes due to high air pressure.
- 2) Optimized Control of Supply Duct Static Pressure (ASHRAE 90.1, Guideline 36) - Minimize energy usage by controlling system static pressure to the lowest level while maintaining zone airflow requirements. Trim and respond reset logic shall reset setpoint within the range of min and max values based on zone requests.
 - 3) During commissioning, and with the engineer/owner, the controls contractor shall confirm the performance of Optimized Control of Supply Duct Static Pressure by conducting a field functional test that demonstrates critical zone reset.
 - 4) Demand Controlled Ventilation – the active ventilation setpoint shall modulate between the occupied ventilation and occupied standby ventilation setpoint; Resetting the setpoint based on CO2 levels in the space.
- c. The Air Systems application shall provide a user interface that includes status of current system operation with real time data of key operating parameters. Key operating parameters for Guideline 36 include:
- 1) Duct Static Pressure
 - 2) Duct Static Optimization Setpoint
 - 3) Ventilation Optimization Setpoint
 - 4) Ventilation Optimization Maximum VAV Vent Ratio/Source VAV box
 - 5) Discharge Air Temperature
 - 6) Duct Static Optimization System Requests
- d. The air system application status screens shall explain what optimization calculations are occurring, critical parameters, and source equipment members.
- e. The air systems applications shall provide a user interface that enables configuration changes made by swipe and type fields, selection list, and check box entry for feature definition:
- 1) VAV Auxiliary Night Heat
 - 2) VAV Source Temperature Distribution
 - 3) Changeover System control
 - 4) Start/Stop Delay operation
 - 5) Enable/Disable Optimization Strategies
- f. The operation of VAV Terminal equipment members of the VAV Air System shall be selected by check box to optionally participate in the following functions:
- g. The operation of VAV Terminal equipment members of the VAV Air System shall be selected by check box to optionally participate in the following functions when for Guideline 36 applications:
- 1) System calculations (min, max, average)
 - 2) Duct Pressure Optimization
 - 3) Ventilation Optimization
 - 4) Drive to Maximum Override
 - 5) Common Source Temperature
 - 6) Common Space
- h. The air system application vendor shall provide a published applications guide that details the air system application operation, configuration,

setup, and troubleshooting. The applications guide documentation shall be maintained under version control, and updated by the manufacture to reflect most recent feature updates as made available. Contents of the guide shall include:

- 1) Description of System Operation
 - 2) Required Components
 - 3) Sequences of Operation
 - 4) Installation
 - 5) Controller Setup
 - 6) Required Programming
 - 7) Commissioning
 - 8) Optimization Strategies
 - 9) Special Applications
 - 10) Troubleshooting
- i. The air system application shall present in plain user language the current operation with source zone information and reset events.

C. Trend Logs

1. The system shall harvest trend logs for defined key measurements for each controlled HVAC device and HVAC application. Trend logs shall be captured for a minimum of 5 key operating points for each piece of HVAC equipment and HVAC application and stored for no less than 1 year at 15-minute intervals. Data Logs shall be capable of being configured on an interval or change of value basis.
 - a. Variable Air System (VAS)
 - 1) Duct Static Optimization Duct Static Setpoint
 - 2) Space Temperature Average
 - 3) Ventilation Optimization Air Setpoint
 - 4) Operating Mode
 - 5) Duct Pressure Optimization Maximum
 - b. Air Handling Unit/Rooftop (VAV)
 - 1) Discharge Air Temperature
 - 2) Discharge Air Temperature Setpoint Active
 - 3) Space Temperature Active
 - 4) Cooling Capacity Status
 - 5) Discharge Air Flow
 - c. VAV box
 - 1) Discharge Air Temperature
 - 2) Space Temperature Active
 - 3) Space Temperature Setpoint Active
 - 4) Air Flow Setpoint Active
 - 5) Discharge Air Flow

D. Trim and Respond

1. The BAS shall provide a setpoint reset application program based on 'trim and respond' functionality as outlined in ASHRAE Guideline 36.

END OF SECTION 230900

SECTION 230993 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes sequence of operation for:
 - 1. Air Handling Units.
- B. Related Sections:
 - 1. Section 23 04 00 – General Conditions for Mechanical Trades
 - 2. Division 26 - Electrical

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate mechanical system controlled and control system components.
 - 1. Label with settings, adjustable range of control and limits. Submit written description of control sequence.
 - 2. Submit flow diagrams for each control system, graphically depicting control logic.
 - 3. Submit draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of components and set points of controls, including changes to sequences made after submission of shop drawings.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

- A. Provide all controls, low voltage control wiring, hardware points (analog in, analog out, binary in, binary out) and accessories as required to perform the control sequences indicated. Additionally, provide hardware points indicated regardless that such points may not be required to perform the control sequences indicated.
- B. Unless otherwise indicated, setpoints and values listed in the sequence of controls shall be adjustable by the Owner thru the DDC (direct digital controls) or BMS (Building Management System) (BMS and DDC are used interchangeably and share same meaning) graphical interface; the Owner shall not be required to edit operating code in order to change any of the setpoints and values.
- C. Heating shall only be enabled when the system is indexed to heating mode (shall occur when outside air temperature is below 65°F).
- D. Temperature Sensors
 - 1. General
 - a. Where temperature ranges, reset temperatures, setback temperatures, setup temperatures, deadbands, override times, etc. are indicated, those values shall be adjustable both globally and locally.
 - b. Each temperature control zone shall be initially set to default to the global settings, with a flag or similar to override the global setting for each of the values for that zone.
 - c. The values indicated herein shall be the initial global settings.
 - 2. Classroom spaces
 - a. Unless otherwise indicated, temperature sensors shall be digital temperature adjustment (plus & minus two degrees from BMS setpoint) where occupant can change room temperature setpoints with BMS lockout capabilities. Initial setpoints for sensors shall be as follows:
 - b. Occupied
 - 1) Heating (defined as outside air temperature is below 65°F): 68°F.

- 2) Cooling (defined as outside air temperature is above 68°F): 75°F.
 - c. Unoccupied
 - 1) Heating: 58°F.
 - 2) Cooling: 82°F.
 - d. Occupied Override
 - 1) Where there are no occupancy sensors in the same space as a temperature sensor, temperature sensors shall be provided with momentary type occupied override buttons. Upon activation of the occupied override button, the space will go to occupied mode for a specific period of time. Set override time at 3 hours initially (configurable).
- E. Occupied/Unoccupied Programming
- 1. The HVAC equipment shall be indexed to warm-up and cool-down modes via the BMS, optimal start/stop shall be programmed in for all equipment so that equipment start and start times are determined based on outside air conditions and system learns based on past building history. The operator station software configuration shall allow the Owner to easily select the occupied and unoccupied hours by individual zone, global by air handler, or global by building. The BMS shall trend the outside air temperature with respect to the warm-up times, and shall optimize the warm-up times such that the spaces reach occupied temperature by the time selected.
 - 2. Terminal heating and cooling units
 - a. Warm-up (morning): Units shall operate in the warm-up mode until the space reaches the occupied temperature setpoint, at which point the unit shall be indexed to the occupied mode.
 - b. Cool-down (evening): Units shall operate in the cool-down mode until the space reaches the unoccupied temperature setpoint, at which point the unit shall be indexed to the unoccupied mode.
- F. Air handling units: Shall remain in the warm-up mode until all spaces served reach occupied temperature setpoints, at which point the units shall be indexed to occupied mode.

3.2 CONTROL DEVICES

- A. All devices and sensors shall be adjustable. BMS shall display setpoints and actual conditions/status of all control devices and position of all actuators (damper and valve, with the exception of at finned tube radiators where position/status of actuators is not required at control valve) at the central personal computer (PC) thru the use of end switches and potentiometers integral to actuators.

3.3 ECONOMIZER COOLING

- A. Where economizer cooling is indicated as the first stage of cooling, the economizer cooling sequence of control shall be as follows:
 - 1. Economizer cooling shall be enabled when all of the following are true (see also paragraph 2.):

- a. The outside air temperature is less than 65°F.
 - b. The outside air temperature is less than the return air temperature.
 - c. The outside air enthalpy is less than 22 btu/lb.
 - d. The outside air enthalpy is less than the return air enthalpy.
2. The BMS system operator shall, via single click editing, be easily able to select any or all of items a. thru d. of the previous paragraph for economizer enabling, for individual air handling systems and for air handling systems globally. Additionally, the BMS system operator shall be easily able to globally change the setpoints for items a. and c. of the previous paragraph.
 3. Economizer cooling shall be integrated; economizer cooling shall continue to operate during stages of mechanical cooling as long as all four of the conditions indicated in paragraph 1 are true (or as selected by the system operator per paragraph 2).
 4. When both mechanical cooling is anticipated to be required the next day (by trending the outside air enthalpy), and economizer cooling is available during the unoccupied cycle, economizer cooling shall be operated during the unoccupied cycle to pre-cool the spaces served by the air handler to 70°F.

3.4 FIN TUBE RADIATION

- A. General: ATC Contractor to provide and monitor space sensor.
- B. Fin Tube Radiation with air handling units
 1. Fin Tube Radiation shall be the first stage of heating.
 - a. Warm-up (morning): On call for heating the control valve shall be open.
 - b. Occupied: On call for heating the control valve shall be open.
 - c. Cool-down (evening): The control valve shall be closed.
 - d. Unoccupied: On call for heating the control valve shall be open.

3.5 AIR TERMINAL UNITS

- A. Single Duct Variable Volume Air Terminal Units (with Heating Coil):
 1. Occupied Cycle: On rise in space temperature above cooling setpoint, air terminal unit damper modulates open to maximum air quantity. As space temperature drops below cooling setpoint, air terminal unit damper modulates closed to its minimum air quantity. As space temperature continues to fall to heating setpoint, air terminal unit damper modulates to heating minimum air quantity. Heating coil will modulate open heating coil control valve.
 2. Unoccupied Cycle: Air terminal damper is normally closed. Heating is staged to maintain reduced space temperature. Heating coil control valve is normally closed.

3.6 PACKAGED ROOFTOP UNIT

- A. APPLICATION CONTROLLER for Packaged Rooftop Units
 1. The Rooftop Unit (RTU) Application Controller shall be a microprocessor-based DDC controller which, through hardware or firmware design, controls specified

- equipment. The controller is not user programmable, but is customized for operation within the confines of the equipment it is designed to serve.
2. The Application Controller shall be capable of operating as a stand-alone controller or as a member of a Building Automation System (BAS).
 3. When the Application Controller is operating as a member of a Building Automation System (BAS), the application controller shall operate as follows:
 - a. Application Controller will receive operation mode commands from the BAS network controller. The BAS commands shall include but not be limited to the follow: Occupied Heat/Cool, Unoccupied Heat/Cool, Morning Warm-up, / Pre-cool, Occupied Bypass).
 - b. Application Controller will provide equipment status parameters to the BAS through BACnet communication.
 - c. Application Controller will operate as a stand-alone controller in the event of communication failure with the BAS.
 - d. In case of communications failure stand-alone operation shall use default values or last known values for remote sensors read over the network such as outdoor air temperature.
 4. Software
 - a. To meet the sequence of operation for each zone control, the controller shall use programs developed and tested by the controller manufacturer that are either factory loaded or customized with use of service tool native to the controller.
 5. Environment: Controller hardware shall be suitable for the anticipated ambient conditions.
 - a. Controllers used outdoors and/or in wet ambient shall be mounted within NEMA 4 type waterproof enclosures, and shall be rated for operation at -40° to 158° F
 6. Controller Input/Output: The controller shall have on board capable of performing all functionality needed for the application. Controls provided by the equipment manufacture must supply the required I/O for the equipment.
 - a. For flexibility in selection and replacement of valves, the controllers shall be capable of supporting all of the following output types; 0-10VDC, 0-5VDC, 4-20mA, Binary.
 - b. For flexibility in selection and replacement of sensors, the controllers shall be capable of reading sensor input ranges of 0 to10V, 0 to 20mA, Pulse counts, and 200 to 20Kohm.
 7. Serviceability – The controller shall provide the following in order to improve serviceability of the controller.
 - a. Diagnostic LEDs shall indicate correct operation or failures/faults for all of the following: power, sensors, BACnet communications, and I/O communications bus.
 - b. All binary output shall have LED's indicating the output state.
 - c. All wiring connectors shall removable without the use of a tool.
 - d. Software service tool connection through the following methods: direct cable connection to the controller, connection through another controller on BACnet link.
 8. Software Retention: All Zone Controller operating parameters, setpoints, BIOS, and sequence of operation code must be stored in non-volatile memory in order to maintain such information for months without power.

9. Controller shall meet the following Agency Compliance:
 - a. UL916 PAZX, Open Energy Management Equipment
 - b. UL94-5V, Flammability
 - c. FCC Part 15, Subpart B, Class B Limit
 - d. BACnet Testing Laboratory (BTL) listed

B. CHANGE-OVER HEAT / COOL VAV AIR SYSTEM

1. System Operating modes:
 - a. The Building Automation System (BAS) controller shall include a user-adjustable time-of-day schedule to define when the various areas of the facility are expected to be occupied versus unoccupied. Then, based on current zone conditions, the BAS determines the current system operating mode. The BAS controller shall send the following operating modes to the unit level controllers that are a member of the air system: Occupied Heat/Cool, Unoccupied Heat/Cool and Morning Warmup/Pre-cool, Occupied Bypass.
2. Heating and Cooling Changeover Logic
 - a. The temperature of each zone is communicated to the BAS, The BAS controller will determine the overall system cooling/heating mode decision is determined based on “voting” from each zone. When the majority of zones require cooling, the HVAC unit will be controlled to cooling mode and deliver cool air to the VAV boxes, and any zones that require heat at the same time will be controlled to their minimum airflow settings, and local (or remote) heating will be utilized (when included in the terminal unit). When the majority of zones require heating, the HVAC unit will be controlled to heating mode and deliver warm air to the VAV boxes, and any zones that require cooling at the same time will be controlled to their minimum airflow settings.
3. Occupied Heat/Cool
 - a. During the Occupied Mode, each VAV terminal unit shall be activated to maintain zone temperature at the occupied setpoint (cooling or heating). Meanwhile, the rooftop unit (RTU) modulates the supply fan to maintain duct static pressure at desired setpoint, positions the outdoor-air damper to bring in required amount of ventilation, and increases/decreases the source of cooling or heating to maintain discharge air at the desired setpoint.
4. Unoccupied Heat/Cool
 - a. During the Unoccupied Mode, each VAV terminal unit shall be activated to maintain zone temperature at the unoccupied setpoint (cooling or heating). Meanwhile, the RTU shuts off, unless a zone requires unoccupied cooling or heating. If needed to operate, the RTU modulates the supply fan to maintain duct static pressure at desired setpoint, closes the outdoor-air damper, and increases/decreases the source of cooling or heating to maintain discharge air at the desired setpoint.
5. Morning Warm-up/Pre-cool
 - a. During the Morning Warm-up/Pre-cool Mode, each VAV terminal unit shall be activated to raise or lower the zone temperature to the occupied setpoint (cooling or heating) and then closes. Meanwhile, the RTU modulates the supply fan to maintain duct static pressure at desired

setpoint, and increases/decreases the source of cooling or heating to discharge air at the desired setpoint.

6. Occupied Bypass
 - a. The BAS shall monitor the status of the “on” and “cancel” buttons of the system’s space temperature sensors. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode.

C. OPTIMIZED SYSTEM-LEVEL CONTROL SEQUENCES:

1. Optimal Start
 - a. The BAS shall initiate Optimal Start mode such that the RTU is started and VAV boxes are enabled to allow the zone temperature to reach the occupied heating or cooling setpoint prior to scheduled occupancy. The system shall wait as long as possible before starting, so that the temperature in each zone reaches the occupied setpoint just in time for scheduled occupancy.
2. Optimal Stop
 - a. The BAS shall initiate Optimal Stop mode such that cooling or heating is disabled so that the zone temperature does not drift beyond the occupied standby setpoint by the end of the scheduled occupancy period. The RTU supply fan shall continue operating, and ventilation control shall continue, through the end of the scheduled occupancy period.
3. Unoccupied Economizing (Night Purge)
 - a. Between 4:00 AM (adj.) and 6:00 AM (adj), the system controller shall initiate Unoccupied Economizing mode if the current zone temperature is at least 1°F warmer than the occupied cooling setpoint and the outdoor dry-bulb temperature is more than 15°F (adj) cooler than the current zone temperature. When initiated, the RTU is started (OA damper fully open, cooling source is off) and VAV boxes are enabled to allow the zone temperature to cool to the occupied cooling setpoint.
4. Optimized Control of Supply Duct Static Pressure (Fan-Pressure Optimization)
 - a. At a frequency of once every 2 minutes (adj), the system controller shall monitor the damper position and airflow of all VAV terminal units. The system controller shall calculate a new supply fan duct static pressure setpoint based on the criteria shown below, and send this newly-calculated setpoint to the RTU controller.
 - b. All values below are adjustable:
 - 1) If the measured airflow is less than 50% of set point while set point is greater than zero and the damper position is greater than 95% for 1 minute, send 3 requests.
 - 2) Else if the measured airflow is less than 70% of set point while set point is greater than zero and the damper position is greater than 95% for 1 minute, send 2 requests.
 - 3) Else if the damper position is greater than 95%, send 1 request until the damper position is less than 85%.
 - 4) Else if the damper position is less than 95%, send 0 requests.
 - c. System shall default to ignoring the first 2 requests (adj). When Requests > Ignores the system shall respond by adjusting setpoint upward by (Requests – Ignores) * .06 inH20 (adj), but no larger than .13

inH20 (adj). When Requests are equal to, or less than Ignores the setpoint shall be reset downward by -.05 inH20 (adj). Setpoint shall be bound by a minimum and maximum value which can be set per air handler.

5. Optimized Control of Ventilation (Demand-Controlled Ventilation) with RTU Return Air CO2
 - a. When the BAS time-of-day schedule indicates that a zone is occupied, if the CO2 concentration measured in the zone rises above the desired upper limit, the VAV controller shall modulate the VAV damper further open. Increasing primary airflow results in more outdoor air delivered to the zone, but may activate local or remote heat (if equipped) to prevent the zone from over cooling. Concurrently, the RTU controller shall adjust the position of the outdoor-air damper in response to the CO2 concentration measured in the common return-air duct.

D. Display:

1. System graphic.
2. System on/off indication.
3. System day/night mode.
4. System fan on/off indication.
5. Return fan on/off indication.
6. Gas fired heating coil on/off indication.
7. Outside air temperature indication.
8. Mixed air temperature indication.
9. Fan discharge air temperature indication.
10. Reheat zone air temperature indication.
11. Return humidity indication.
12. Fan discharge temperature control point adjustment.
13. Return humidity control point adjustment.
14. Reheat zone control point adjustment.
15. Supply static pressure indication.
16. Supply static pressure control point adjustment.
17. Building static pressure indication.
18. Building static pressure control point adjustment.
19. Outside air flow rate.

END OF SECTION 230993

SECTION 26 0400 - GENERAL CONDITIONS FOR ELECTRICAL

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This section applies to certain sections of Division 08 "Openings", Division 11 "Equipment", Division 12 "Furnishings", Division 21 "Fire Protection", Division 22 "Plumbing", Division 23 "Mechanical," Division 27 "Communications", Division 28 "Electronic safety and Security", Division 33 "Utilities" and this section applies to all sections of Division 26, "Electrical" of this project specification unless specified otherwise in the individual sections.
- C. The Drawings of other trades Architectural, Structural, Landscape, Civil, Mechanical, Fire Protection and Plumbing, Food Service, Communications, and Electronic Safety and Security shall be examined for coordination and familiarity of work with other Contractors. Any duplication or omission of provisions in this project should be brought to the attention of the Owners prior to Bidding.
- D. The drawings of equipment suppliers shall be examined for coordination and familiarity of work with Owner's equipment suppliers.

1.2 DESCRIPTION

- A. The General Conditions and Supplementary General Conditions are a part of this Division and are to be considered a part of this Contract.
- B. Where items of the General Conditions and Supplementary General Conditions are repeated in other Sections of the Specifications, it is merely intended to qualify or to call particular attention to them. It is not intended that any other parts of the General Conditions and Supplementary General Conditions shall be assumed to be omitted if not repeated therein. This Section applies equally and specifically to all Contractors supplying labor and/or equipment and/or materials as required under each Section of this Division, (Division 27 and Division 28). Where conflicts exist between the drawings and the specifications or between this section of the specifications and other sections, the more stringent or higher cost option shall apply.
- C. It is the intent of this Section of the Specifications to establish a standard of quality and performance characteristics for basic materials and installation methods used in building electrical (communications and electronic safety and security) systems.

1.3 INTENT

- A. This contract is for all labor, materials and equipment required for installation. The system shall be complete and finished in all respects, tested and ready for operation. Work shall include calibration of equipment with factory settings. All materials, equipment and apparatus shall be new and of first class quality.

- B. Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation as determined by good trade practice even if not particularly specified, shall be furnished, delivered and installed under their respective Divisions without any additional expense to the Owner.
- C. Minor details not usually shown or specified but necessary for proper installation and operation shall be included in the work as though they were hereinafter shown or specified.
- D. Work under each Section shall include giving written notice to the Owner and Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, it is mutually agreed that work under each Section has included the cost of all required items for the accepted, satisfactory functioning of the entire system without extra compensation.
- E. Location of all existing systems and equipment shown on floor plans is based on the best available information. The Contractor shall verify all dimensions and locations of existing systems and equipment in the field and adjust as necessary.
- F. Certain items of existing equipment may be indicated for removal or relocation. Items noted for removal shall be disconnected and turned over to the Owner or disposed of by the Contractor if the Owner so requests. If instructed to dispose of items, the Contractor shall remove the items from the premises and dispose of them in a safe, legal and responsible manner and location. Items noted for relocation are intended for reuse in another location as designated on the Drawings. It shall be the responsibility of the Contractor to remove the material from its present location, store the material in a safe place and reinstall the material in its new location. Questions regarding the suitability of the material or equipment shall be brought to the attention of the Owner and Engineer in writing.
- G. Wherever a particular piece of equipment, device or material is specifically indicated on the Drawings by model number, type, series or other means, that specification shall take precedence over equipment or materials specified herein. For example: If a particular switch is specified on the Drawings, its specification takes precedence over switch specified herein.

1.4 DEFINITIONS

- A. Word "Subcontractor" means specifically the subcontractor working under this Division. Other Contractors are specifically designated "Plumbing Subcontractor", "General Contractor" and so on. Note: Take care to ascertain limits of responsibility for connecting equipment which requires connections by two or more trades.
- B. Word "install" shall mean set in place complete with all mounting facilities and connections as necessary ready for normal use or service.

- C. Words “furnish” or “supply” shall mean purchase, deliver to, and off-load at the job site, all ready to be installed including where appropriate all necessary interim storage and protection.
- D. Word “provide” shall mean furnish (or supply) and install as necessary.
- E. Word “finished” refers to all rooms and areas scheduled to be painted in Room Finish Schedule on the drawings. All rooms and areas not covered in Schedule, including underground tunnels and areas above ceilings shall be considered not finished, unless otherwise noted.
- F. No Exceptions Taken – reviewed and determined to be in general conformance with contract documents.
- G. Words “approved equal” mean any product which in the opinion of the Engineer is equal in quality, arrangement, appearance, and performance to the product specified.
- H. Word “wiring” shall mean cable assembly, raceway, conductors, fittings and any other necessary accessories to make a complete wiring system.
- I. Word “product” shall mean any item of equipment, material, fixture, apparatus, appliance or accessory installed under this Division.
- J. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions."
- K. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- L. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.
- M. Approve: The term "approved," where 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 General and Supplementary Conditions.
- N. Regulation: 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.
- O. Remove: The term “remove” means “to disconnect from its present position, remove from the premises and to dispose of in a legal manner.”
- P. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

- Q. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.5 DRAWINGS

- A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the Contract. Consult the Architectural Drawings and Details for exact location of fixtures and equipment; where same are not definitely located, obtain this information from the Architect. (Do not scale the drawings)
- B. Work under each Section shall closely follow Drawings in layout of work; check Drawings of other Divisions to verify spaces in which work will be installed. Maintain maximum headroom; where space conditions appear inadequate, Owner and Engineer shall be notified before proceeding with installations.
- C. The Owner may, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades and/or for proper execution of the work.
- D. Where variances occur between the Drawings and Specifications or within either of the Documents, the item or arrangement of better quality, higher rating, or higher value shall be included in the Contract price. The Owner and Engineer shall decide on the item and the manner in which the work shall be installed.

1.6 SURVEYS AND MEASUREMENTS

- A. Before submitting his Bid, the Contractors shall visit the site and become thoroughly familiar with all existing conditions under which his work will be installed. This Contract includes all modifications of existing systems required for the installation of new equipment. This Contract includes all necessary offsets, transitions and modifications required to install all new equipment in existing spaces. All new and existing equipment and systems shall be fully operational under this Contract before the job is considered complete. The Contractors shall be held responsible for any assumptions he makes, any omissions or errors he makes as a result of his failure to become fully familiar with the existing conditions at the site and the Contract Documents.
- B. The Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.
- C. Should the Contractor discover any discrepancies between actual measurements and those indicated which prevent following good practice or which interfere with the intent of the Drawings and Specifications, the Engineer will be notified and work will not proceed until instructions from the Engineer are received.

1.7 CODES AND STANDARDS

- A. Reference Standard Compliance
1. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
 2. Independent Testing Organization Certificate: In lieu of the label or listing, indicated above submit a certificate from an independent testing organization, competent to perform testing, and approved by the engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- B. The Following Codes and Standards for the state and local jurisdiction where the project is located as listed below apply to all electrical work. Wherever Codes and/or Standards are mentioned in these Specifications, the latest applicable edition or revision shall be followed:
- Connecticut State Building Code Including all Supplements
 - Connecticut State Fire Safety Code Including all Supplements
 - The International Building Code
 - The International Mechanical Code
 - The International Plumbing Code
 - NFPA 70, the National Electrical Code
 - NFPA 101, the Life Safety Code
 - Model Energy Code
 - NECA - 1 Standard for Good Workmanship in Electrical Construction
 - ASHRAE 90.1 and International Energy Conservation Code
- C. The following Standards shall be used where referenced by the following abbreviations:
- | | |
|------|---|
| AIA | American Institute of Architects |
| ANSI | American National Standards Institute |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society of Testing and Materials |
| EPA | Environmental Protection Agency |
| FM | Factory Mutual |
| FSSC | Federal Specification |
| IEEE | Institute of Electrical and Electronics Engineers |
| NBS | National Bureau of Standards |
| NECA | National Electrical Contractors Association |
| NEMA | National Electrical Manufacturers Association |
| NFPA | National Fire Protection Association |
| NSC | National Safety Council |
| OSHA | Occupational Safety and Health Administration |
| UL | Underwriters' Laboratories |

- D. All materials furnished and all work installed shall comply with the rules and recommendations of the NFPA, the requirements of the local utility companies, the recommendations of the fire insurance rating organization having jurisdiction and the requirements of all Governmental departments having jurisdiction.
- E. The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and Drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether shown on Drawings and/or specified or not.

1.8 PERMITS AND FEES

- A. The Contractor shall give all necessary notices, obtain all permits; and pay all Government and State sales taxes and fees where applicable, and other costs, including utility connections or extensions in connection with the work, file all necessary Drawings, prepare all documents and obtain all necessary approvals of all Governmental and State departments having jurisdiction, obtain all required certificates of inspection for his work, and deliver a copy to the Owner and Engineer before request for acceptance and final payment for the work.

1.9 EQUIPMENT EQUIVALENTS AND SUBSTITUTIONS

- A. Certain manufacturers of material, apparatus or appliances are indicated in the drawings and specifications for this project. These items have been used as the basis of design, and as a convenience in fixing the minimum standard of workmanship, finish and design that is required. If the Contractor uses an "approved equal" alternative to the basis of design, and if the features of that alternative have an impact on other components of the Project, the Contractor shall include the necessary adjustments in those components, whether for architectural, structural, mechanical, electrical, fire protection, or any other elements, plus any adjustments for difference in performance.
- B. Where one name only is used and is followed by the words "or approved equal", the Contractor must use the item named or he is required to apply for a substitution. Where one name only is used, the Contractor must use that item named.
- C. Where no specific make of material, apparatus or appliance is mentioned, any first-class product made by a reputable manufacturer may be submitted for Architect and Engineer review.
- D. Where the Contractor proposes to use an item that is different from the basis of design in the Drawings and specifications, and that will require the redesign of the structure, partitions, foundations, piping, wiring or any other component of the mechanical, electrical, or architectural layout, the Contractor shall provide the necessary redesign of those components.
- E. Where the Contractor proposes to deviate (provide an equivalent or request for substitution) from the basis of design scheduled equipment or materials as hereinafter specified or shown on the drawings, they are required to submit a requested for substitution in writing. The Contractor shall state in their request whether it is a substitution, equivalent or a non approved equivalent to that specified and the amount of credit or extra cost involved. A copy of said request shall be included in the Base Bid

with manufacturer's equipment cuts. The Base Bid shall be based on using the materials and equipment as specified with no exceptions.

- F. If an alternative or substitute item results in a difference in quantity and arrangement of piping, ductwork, valves, pumps, insulation, wiring, conduit, and equipment from that specified or indicated on the Drawings, the Contractor shall furnish and install any such additional equipment required by the system, at no additional cost to the Owner including any costs added to other trades due to the equivalent change from the basis of design detailed in the drawings or included within the specifications.
- G. Equipment, material or devices submitted for review as an "equivalent" shall meet the following requirements:
1. The equivalent shall have the same construction features such as, but not limited to:
 - a. Material thickness, gauge, weight, density, etc.
 - b. Welded, riveted, bolted, etc., construction
 - c. Finish, undercoating, corrosion protection
 2. The equivalent shall perform with the same or better operating efficiency.
 3. The equivalent shall be locally represented by the manufacturer for service, parts and technical information.
 4. The equivalent shall bear the same labels of performance certification as is applicable to the specified item, such as UL or NEMA labels.
- H. Equipment, material or devices submitted for review as a "substitution" shall meet the following requirements:
1. Substitution Request Submittal: Requests for substitution will be considered if received in writing 14 days before the bid date. Requests received later than 14 days before the bid date may be considered or rejected at the discretion of the Engineer/Owner. Once the Contractor submits a complete request for substitution as determined by the engineer, the engineer reserves the right to request the time necessary to evaluate the request for substitution and review it with the Owner.
 2. Submit three (3) copies of each request for substitution for consideration.
 3. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - d. 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 become necessary to accommodate the proposed substitution.

- e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
- f. Cost information, including a proposal of the net change, if any in the Contract Sum.
- g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
- h. Engineer's Action: Within one week of receipt of the request for substitution, the Engineer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance of a product substitution will be in the form of an Addendum.
- i. Other Conditions: The Contractor's substitution request will be received and considered by the Engineer when one or more of the following conditions are satisfied, as determined by the Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1) The request is directly related to an "or equal" clause or similar language in the Contract Documents.
 - 2) The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - 3) A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

1.10 SUBMITTAL PROCEDURES

- A. Provide Submittals in accordance with the requirements of Division 1 and as indicated in the following.
- B. 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. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

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. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 3. Allow two weeks for reprocessing each submittal.
 4. 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.
- D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- F. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
- G. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, to indicate the action taken.

1.11 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate 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 considered Shop Drawings.
- B. The Contractor shall submit for review detailed shop drawings of all equipment and material specified in each section and coordinated ductwork layouts. No material or equipment may be delivered to the job site or installed until the Contractor has received shop drawings for the particular material or equipment which have been properly reviewed. Shop drawings shall be submitted within 60 days after award of Contract before any material or equipment is purchased. The Contractor shall submit for review copies of all shop drawings to be incorporated in the Electrical Contract. Refer to the General Conditions and Supplementary General Conditions for the quantity of copies required for submission. Where quantities are not specified, provide seven (7) copies for review.
- C. Provide shop drawings for all devices specified under equipment specifications for all systems including fire alarm, switchgear, clock, lighting, etc., or where called for elsewhere in the Specifications, or where scheduled on the drawings, or where called out on the drawings. Shop drawings shall include manufacturers' names, catalog numbers, cuts, diagrams, dimensions, identification of products and materials included, compliance with specified standards, notation of coordination requirements, notation of dimensions established by field measurement and other such descriptive data as may be required to identify and accept the equipment. A complete list in each category (example: all fixtures) of all shop drawings, catalog cuts, material lists, etc., shall be submitted to the Engineer at one time. No consideration will be given to a partial shop drawing submittal.
- D. Submittals shall be marked with the trade involved, i.e., Electrical, HVAC, Plumbing, Fire Protection, etc. when the submittal could involve more than one trade.
- E. Where multiple quantities or types of equipment are being submitted, provide a cover sheet (with a list of contents) on the submittal identifying the equipment or material being submitted.
- F. Failure to submit shop drawings in ample time for review shall not entitle the Contractor to an extension of Contract time. No claim for extension by reason of such default will be allowed, nor shall the Contractor be entitled to purchase, furnish and/or install equipment which has not been reviewed by the Engineer.
- G. The Contractor shall furnish all necessary templates, patterns, etc., for installation work and for the purpose of making adjoining work conform; furnish setting plans and shop details to other trades as required.

- H. Acceptance rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, review does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the Contract Drawings and Specifications. Verify available space prior to submitting shop drawings.
- I. Acceptance of shop drawings shall not apply to quantity nor relieve Contractor of his responsibility to comply with intent of Drawings and Specifications.
- J. Acceptance of shop drawings is final and no further changes will be allowed without the written consent of the Engineer.
- K. Acceptance of shop drawings does not relieve the Contractor from submitting, coordinating and implementing schedules, forms, worksheets and similar as required for owner/operator input and approval as specified herein and required for proper system operation.
- L. Shop drawing submittal sheets which may show items that are not being furnished shall have those items crossed off to clearly indicate which items will be furnished.
- M. Bidders shall not rely on any verbal clarification of the Drawings and/or Specifications. Any questions shall be referred to the Engineer in writing at least five (5) working days prior to Bidding to allow for issuance of an Addendum.
- N. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.12 COORDINATION DRAWINGS

- A. Prepare coordination drawings in accordance with Division 01 Section "PROJECT COORDINATION," to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. Indicate the proposed locations of light fixtures, panelboards, conduits, cabinets, etc. Include the following:
 - 2. Clearances for installing and maintaining insulation.
 - 3. Clearances for servicing and maintaining equipment, including NEC requirements and space for equipment disassembly required for periodic maintenance.
 - 4. Equipment connections and support details.
 - 5. Exterior wall and foundation penetrations.
 - 6. Fire-rated wall and floor penetrations.
 - 7. Sizes and locations of required concrete pads and bases.
- B. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

- C. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
- D. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.
- E. Electronic copies of the MEP floor plans are available to use as a basis for preparing coordination drawings and can be provided by the Engineer. If the Contractor elects to obtain the Engineers electronic files an Electronic File Release Form must be submitted with payment. This form must be signed by the Contractor, Owner, and Architect. Upon receipt of a signed copy of the Electronic File Release Form, and payment, the Engineer will provide copies of the electronic files for the Contractor's use. A copy of the Electronic File Release Form is appended to the end of this specification section

1.13 COORDINATION WITH OTHER DIVISIONS

- A. All work shall be carried out in conjunction with other trades and full cooperation shall be given in order that all work may proceed with a minimum of delay and interference. Particular emphasis is placed on timely installation of major apparatus and furnishing other Contractors, especially the Contractor or Construction Manager, with information as to openings, chases, sleeves, bases, inserts, equipment locations, panels, etc., required by other trades.
- B. The Contractors are required to examine all of the Project Drawings and mutually arrange work so as to avoid interference with the work of other trades. In general, ductwork, heating, condenser, chilled water piping, sprinkler piping and drainage lines take precedence over water, gas and electrical conduits. The Engineer shall make final decisions regarding the arrangement of work which cannot be agreed upon by the Contractors.
- C. Where the work of the Contractor will be installed in close proximity to or will interfere with work of other trades, the Contractors will cooperate in working out space conditions to make a satisfactory adjustment.
- D. If the work under a Section is installed before coordinating with other Divisions or Sections or so as to cause interference with work of other Sections, the necessary changes to correct the condition shall be made by the Contractor causing the interference without extra charge to the Owner.
- E. Where work is installed prior to preparation and approval of the Coordination Drawings or in conflict with the approved Coordination drawings and if so directed in other Sections, the Contractor indicated shall prepare composite working drawings and sections clearly showing how the work is to be installed in relation to the work of other trades, at no extra charge to the Owner.

1.14 WORKMANSHIP

- A. Service Support: The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory

service to the equipment on a regular and emergency basis during the warranty period of the contract.

- B. Modification of References: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears.
- C. The Contractor shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of the work together with all skilled workmen, journeymen, electricians, helpers and laborers required to unload, transfer, erect, connect, adjust, start, operate and test each system.
- D. Unless otherwise specifically indicated on the Drawings or Specifications, all equipment and materials shall be installed with the acceptance of the Engineer and in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.
- E. All labor for installation of electrical systems shall be performed by experienced, skilled tradesmen under the supervision of a licensed journeyman foreman. All work shall be of a quality consistent with good trade practice and shall be installed in a neat, workmanlike manner. The Engineer reserves the right to reject any work which, in his opinion, has been installed in a substandard, dangerous or unserviceable manner. The Contractor shall replace said work in a satisfactory manner at no extra cost to the Owner.

1.15 SHUTDOWNS

- A. When installation of a new system requires the temporary shutdown of an existing operating system, the connection of the new system shall be performed at such time as designated by the Owner.
- B. The Engineer and the Owner shall be notified in writing of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance whenever possible. The Contractor shall provide all necessary labor, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.

1.16 TEMPORARY UTILITIES

- A. General: Provide new materials and equipment; if acceptable to the Engineer, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.
- C. First Aid Supplies: Comply with governing regulations.
- D. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
- E. Provide temporary lighting in all areas, throughout construction activities.
 - 1. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.
 - 2. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
 - a. Except where overhead service must be used, install electric power service underground.
 - b. 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.
 - 3. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period.
- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- G. Termination and Removal: Unless the Engineer requires that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

1.17 PROJECT PHASING

- A. Work under each Section shall include all necessary temporary connections, equipment, conduit, wiring, fire alarm equipment and testing, lighting and emergency lighting, fire stopping, connection of necessary mechanical equipment, labor, and material as necessary to accommodate the phasing of Construction as developed by the General Contractor or Construction Manager and approved by the Owner. All existing systems that pass-thru an area of the building or are required to be maintained in a phased fashion during construction shall remain operational during all phases of construction. No extra compensation shall be granted the Contractor for work required to maintain existing systems operational or to accommodate the construction phasing of the project.

1.18 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Work under each Section shall include protecting the work and material of all other Sections from damage by work or workmen and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until the facility has been accepted by the Owner. Protect work against theft, injury or damage and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material.
- C. Work under each Section includes receiving, unloading, uncrating, storing, protecting, setting in place and completely connecting equipment supplied under each Section. Work under each Section shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt and/or damage by workmen or machinery. Insure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.19 ADJUSTING AND TESTING

- A. After all the equipment and accessories to be furnished are in place, they shall be put in final adjustment and subjected to such operating tests so as to assure the Engineer that they are in proper adjustment and in satisfactory, permanent operating condition.
- B. Where requested by the Engineer or specified in the contract documents, a factory-trained service representative shall inspect the installation and assist in the initial startup and adjustment to the equipment. The period of these services shall be for such time as necessary to secure proper installation and adjustments. After the equipment is placed in permanent operation, the service representative shall supervise the initial operation of the equipment and instruct the personnel responsible for operation and maintenance of the equipment. The service representative shall notify the Contractor in writing that the equipment was installed according to manufacturer's recommendations and is operating as intended by the manufacturer. Factory start-up reports shall be included in the operation and maintenance manuals under the appropriate equipment section.

1.20 CLEANING

- A. The Contractor shall thoroughly clean all equipment of all foreign substances, oils, dust, dirt, etc., inside and out before final acceptance by the Engineer.
- B. If any part of a system should be stopped or damaged by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and/or remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected at no additional cost to the Owner.
- C. During the course of construction, all conduits shall be capped in an acceptable manner to insure adequate protection against the entrance of foreign matter.
- D. Upon completion of all work under the Contract, the Contractor shall remove from the premises all rubbish, debris and excess materials left over from his work.
- E. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - 1. Remove labels that are not permanent labels.
 - 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces and panelboard interiors.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean light fixtures and lamps.
- F. 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 Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove and dispose of ALL waste materials, packaging material, skids etc. from the site and dispose of in a lawful manner in accordance with municipal, state and federal regulations.
- G. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

1.21 OPERATING AND MAINTENANCE

- A. Upon completion of all work and tests, the Contractor shall furnish the necessary skilled labor and helpers for operating his system and equipment for a period specified under each applicable Section of this Division. During this period, he shall fully instruct the Owner or the Owner's representative in the operation, adjustment and maintenance of all equipment furnished. The Contractor shall give at least seven (7) day notice to the Owner and the Engineer in advance of this period.

- B. The Contractor shall include the maintenance schedule for the principal items of equipment furnished under this Division.
- C. The Contractor shall physically demonstrate procedures for all routine maintenance of all equipment furnished under each respective Section to assure accessibility to all devices.
- D. An authorized manufacturer's representative shall attest in writing that the equipment has been properly installed prior to startup of any major equipment. At a minimum, the following equipment will require this inspection: emergency generator, fire alarm system, nurse call system, paging systems, etc. These letters will be bound into the operating and maintenance books.
- E. Refer to individual trade Sections for any other particular requirements related to operating instructions.
- F. Demonstration shall be recorded and placed on a flash drive, which shall be turned over to the Owner.

1.22 OPERATING AND MAINTENANCE MANUALS

- A. Prepare operating and maintenance manuals in accordance with the requirements of Division 1 and as follows. The Contractor shall prepare six (6) copies of a complete maintenance and operating instructions manual, bound in booklet form. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder.
- B. Manual shall include the following:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing instructions and lubrication charts and schedules.
 - 5. Emergency instructions.
 - 6. Spare parts list.
 - 7. Copies of warranties.
 - 8. Wiring diagrams.
 - 9. Recommended "turn around" cycles.
 - 10. Inspection procedures.
 - 11. Shop Drawings and Product Data.
 - 12. Equipment start-up reports.

- C. Include in the manual, a tabulated equipment schedule for all equipment. Schedule shall include pertinent data such as: make, model number, serial number, voltage, normal operating current, belt size, filter quantities and sizes, bearing number, etc. Schedule shall include maintenance to be done and frequency.
- D. Maintenance and instruction manuals shall be submitted to the Owner at the same time as the seven (7) day notice is given prior to the instruction period.

1.23 ACCEPTANCES

- A. The equipment, materials, workmanship, design and arrangement of all work installed under the Electrical Sections shall be subject to the review of the Engineer.
- B. Within 30 days after the awarding of a Contract, the Electrical Contractor shall submit to the Engineer, for review, a list of manufacturers of equipment proposed for the work under the Electrical Sections. The intent to use the exact makes specified does not relieve the Contractor of the responsibility of submitting such a list.
- C. If extensive or unacceptable delivery time is expected on a particular item of equipment specified, the Contractor shall notify the Owner and Engineer, in writing, within 30 days of the awarding of the Contract. In such instances, deviations may be made pending acceptance by the Engineer or the Owner's representative.
- D. Where any specific material, process or method of construction or manufactured article is specified by reference to the catalog number of a manufacturer, the Specifications are to be used as a guide and are not intended to take precedence over the basic duty and performance specified or noted on the Drawings. In all cases, the Electrical Contractor shall verify the duty specified with the specific characteristics of the equipment offered for review. Equipment characteristics are to be used as mandatory requirements where the Contractor proposes to use an acceptable equivalent.
- E. If material or equipment is installed before it is reviewed and/or approved, the Contractor shall be liable for its removal and replacement at no extra charge to the Owner if, in the opinion of the Engineer, the material or equipment does not meet the intent of, or standard of quality implied by, the Drawings and Specifications.
- F. Failure on the part of the Engineer to reject shop drawings or to reject work in progress shall not be interpreted as acceptance of work not in conformance with the Drawings and/or Specifications. Work not in conformance with the Drawings and/or Specifications shall be corrected whenever it is discovered.

1.24 RECORD DRAWINGS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, 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 whichever 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.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
5. These shall be clearly marked for Record Drawings on a clean set of reproducible paper copies at the completion of the work and turned over to the Owner.
6. Final record documents shall be prepared in the latest Revit version and digital media for all drawings and a clean set of reproducible paper copies shall be turned over to the Owner at the completion of the work.

1.25 WARRANTIES AND BONDS

- A. The following general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties are to be included:
 1. General close-out requirements included in Section "Project Close-out."
 2. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of each applicable Division.
 3. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

1.26 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. 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.
- C. 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

Contract Documents. The 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.

- D. **Owner's Recourse:** Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, right and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- E. **Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer'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 Engineer.
- H. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.
- I. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - 1. Refer to individual Sections of each Division for specific content requirements, and particular requirements for submittal of special warranties.
- J. **Form of Submittal:** At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- K. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.
3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.27 GUARANTEES

- A. The Contractor shall guarantee all material and workmanship under these Specifications and the Contract for a period of one (1) year from the date of final acceptance by Owner. During this guarantee period, all defects developing through faulty equipment, materials or workmanship shall be corrected or replaced immediately by this Contractor without expense to the Owner. Such repairs or replacements shall be made to the Engineers satisfaction.
- B. Contractor shall provide name, address, and phone number of all contractors and subcontractors and associated equipment they provided

1.28 PROJECT CLOSE-OUT

- A. Contractor shall submit annual maintenance proposal to the Architect/Engineer for review and approval as part of the close out documents.
- B. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
- C. Deliver tools, spare parts, extra stock, and similar items.
- D. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- E. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- F. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 1. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.

END OF SECTION 26 0400

Electronic File Release Form

DELIVERY OF ELECTRONIC FILES FOR: _____
Project Name

In accepting and utilizing any drawings or other data on any form of electronic media generated and provided by the Design Professional, the Client covenants and agrees that all such drawings and data are instruments of service of the Design Professional, who shall be deemed the author of the drawings and data, and shall retain all common law, statutory law and other rights, including copyrights.

The Client further agrees not to use these drawings and data, in whole or in part, for any purpose or project other than the project which is the subject of this Agreement. The Client agrees to waive all claims against the Design Professional resulting in any way from any unauthorized changes or reuse of the drawings and data for any other project by anyone other than the Design Professional.

In addition, the Client agrees, to the fullest extent permitted by law, to indemnify and hold the Design Professional harmless from any damage, liability or cost, including reasonable attorneys' fees and costs of defense, arising from any changes made by anyone other than the Design Professional or from any reuse of the drawings and data without the prior written consent of the Design Professional.

Under no circumstances shall transfer of the drawings and other instruments of service on electronic media for use by the Client be deemed a sale by the Design Professional, and the Design Professional makes no warranties, either express or implied, of merchantability and fitness for any particular purpose.

Client's Signature

Date

Company - Title

Architects' Signature

Date

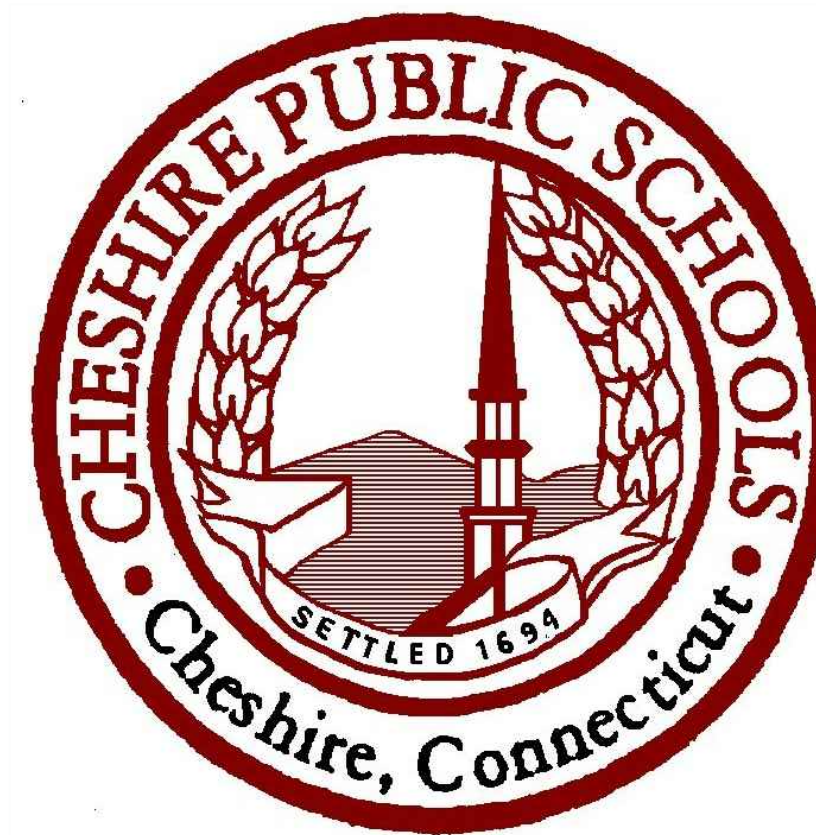
Firm - Title

Owner's Signature

Date

Company - Title

TOWN OF CHESHIRE



HVAC Improvements at Cheshire High School

525 South Main Street
Cheshire, CT 06410

Bid #2223-10

FEBRUARY 4, 2022

ENGINEER:



Consulting Engineering Services, Inc.

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Fax. (860) 632-1768

811 MIDDLE STREET
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ARCHITECT:



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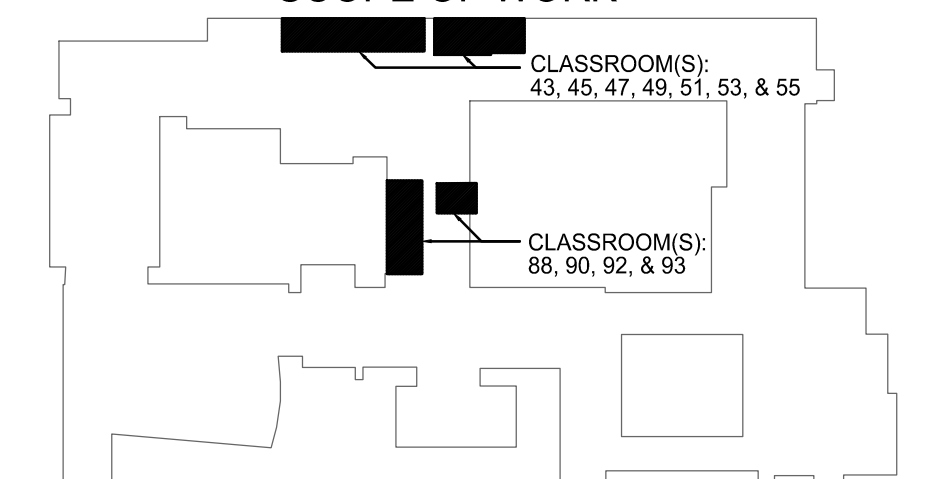
Issued for: BIDDING

DRAWING INDEX

* COVER

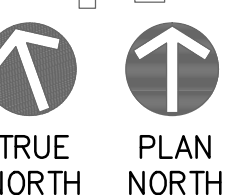
A0.0	Demolition Plan & Notes
A1.0	Floor Plan & Construction Notes
A2.0	Roof Plan & Roof Penetration Details
A3.0	Wall Section & Ceiling Details
A4.0	Reflected Ceiling Plan & Ceiling Notes
FPD1.00	Fire Protection Demolition Floor Plan
FP0.00	Fire Protection Abbreviations, Notes & Symbols
FP1.00	Fire Protection Floor Plan
FP7.00	Fire Protection Drawing Specifications
MED1.00	Mechanical Demolition Floor Plan
M0.00	Mechanical Abbreviations, Notes & Symbols
M1.01	Mechanical Ductwork Floor Plan
MP1.00	Mechanical Piping Floor Plan
M5.00	Mechanical Details
M6.00	Mechanical Schedules & Details
M7.00	Mechanical Drawing Specifications
M7.01	Mechanical Drawing Specifications
P0.00	Plumbing Abbreviations, Notes & Symbols
P7.00	Plumbing Drawing Specifications
E0.00	Electrical Abbreviations, Notes & Symbols
E1.01	Electrical Floor Plan
E6.00	Electrical Schedules & Diagrams
E7.00	Electrical Drawing Specifications

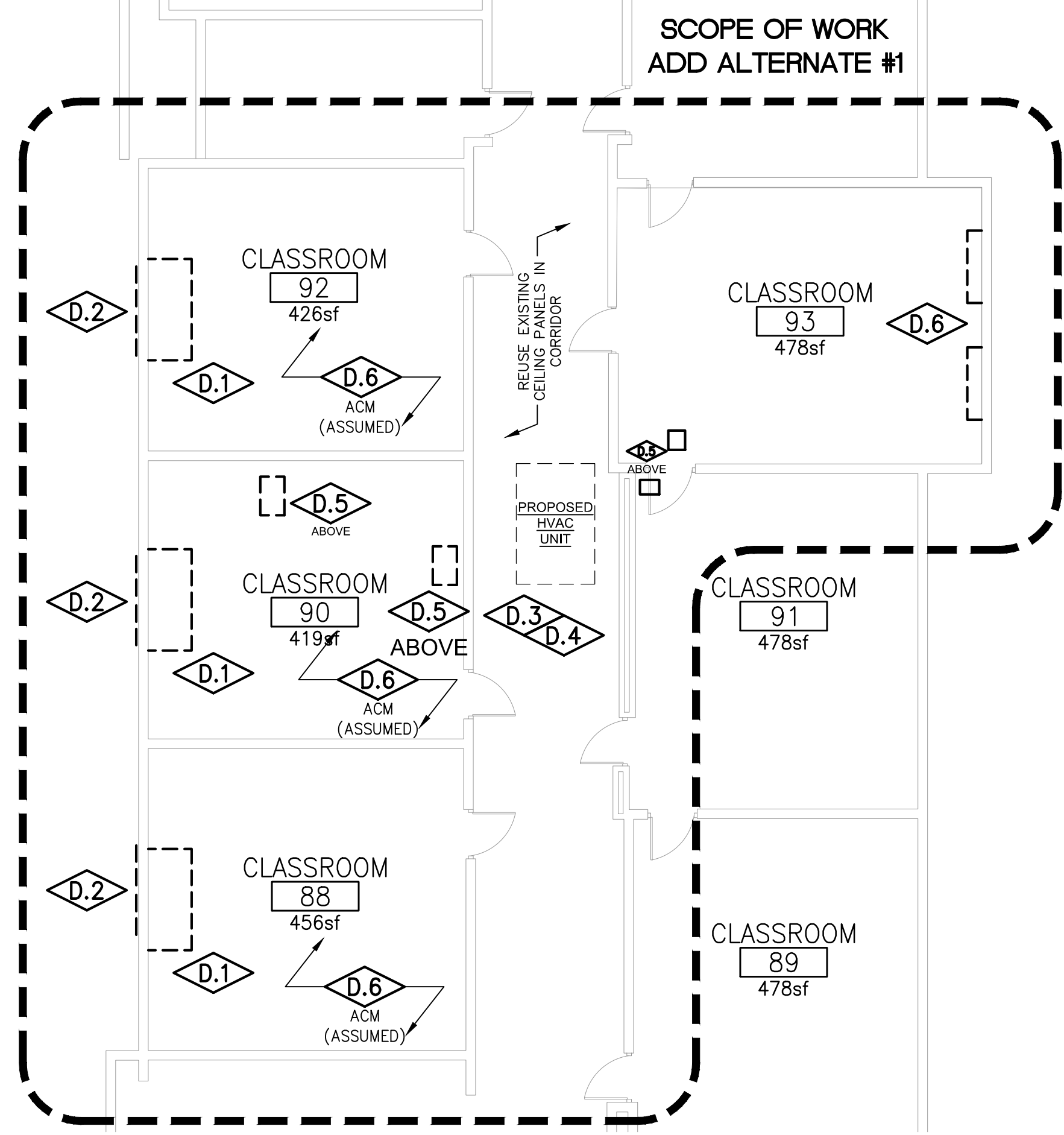
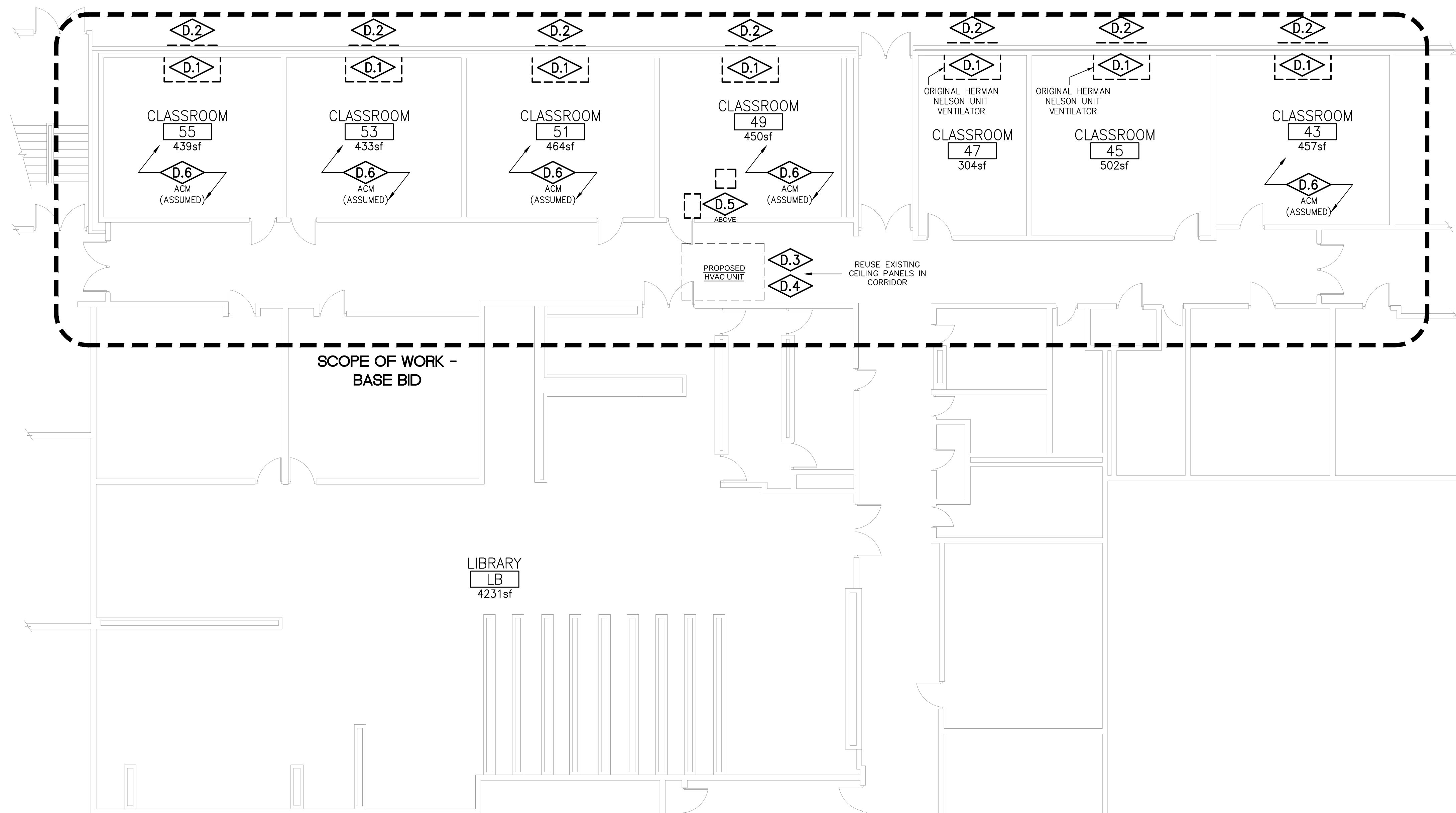
SCOPE OF WORK



KEY PLAN

1/128" = 1'-0"





CODE INFO

CODES TO WHICH THIS PROJECT WAS DESIGNED:
 THE INTERNATIONAL EXISTING BUILDING CODE (IEBC)
 CLASSIFICATION OF WORK - Section 304, ALTERATION - LEVEL 1
 Required Compliance with Chapter 5 & 6: ALTERATIONS-LEVEL 1
 of the International Existing Building Code (IEBC)

CONNECTICUT STATE BUILDING CODE:
 2018 CT State Building Code
 2017 CT State Fire Safety Code
 2015 International Building Code
 2015 International Existing Building Code
 2015 International Plumbing Code
 2015 International Mechanical Code
 2017 National Electrical Code (NFPA 70)
 2015 International Energy Conservation Code
 2015 International Residential Code
 2009 ICC/ANSI A117.1

DRAWING INDEX

A0.0	DEMOLITION PLAN & NOTES
A1.0	PROPOSED PLAN AND CONSTRUCTION / CEILING NOTES
A1.1	REFLECTED CEILING PLAN & CEILING NOTES
A2.0	ROOF PLAN AND ROOF PENETRATION DETAILS
A3.0	PANEL & CEILING DETAILS

HAZARDOUS MATERIAL NOTES:

IT IS UNKNOWN IF THE BUILDING HAS BEEN PREVIOUSLY TESTED FOR THE PRESENCE OF ASBESTOS-CONTAINING-MATERIALS (ACM).

EXISTING 9X9 FLOOR TILES WITHIN THE SCOPE OF WORK ARE SUSPECT TO BEING ACM BUT NO FURTHER TESTING HAS BEEN CONDUCTED.

OWNER IS RESPONSIBLE FOR SEEKING OUT HAZARDOUS MATERIAL TESTING OF ALL SUSPICIOUS MATERIALS THROUGHOUT SCOPE OF WORK. A HAZMAT PLAN SHALL BE PROVIDED PRIOR TO THE COMMENCEMENT OF WORK

DEMOLITION NOTES

- THE DEMOLITION PLANS ARE DIAGRAMMATIC AND INTENDED TO SHOW THE GENERAL EXTENT OF THE WORK ONLY. THE CONTRACTOR SHALL INCLUDE ALL DEMOLITION WORK REQUIRED TO ACCOMPLISH THE INTENT OF THE PLANS AND SPECIFICATIONS.
- ALL DEMOLISHED ITEMS SHALL BE REMOVED FROM BUILDING / SITE UNLESS OTHERWISE NOTED. COORDINATE WITH OWNER FOR DELIVERY OF ITEMS NOTED TO REMAIN OWNERS PROPERTY. THE PROJECT SITE/BUILDING SHALL BE CLEANED OF DEBRIS ON A DAILY BASIS.
- PREPARE EXISTING WALLS AS REQUIRED FOR SELECTIVE DEMOLITION AND/OR NEW FINISHES.
- ALL ITEMS NOTED AS SALVAGE SHALL BE REMOVED, PROTECTED AND TURNED OVER TO THE OWNER.
- ALL OPENINGS WHERE EXISTING CONSTRUCTION HAS BEEN REMOVED, AND WHICH ARE NOT NOTED TO REMAIN, SHALL BE FILLED AND / OR PATCHED TO MATCH THE ADJACENT EXISTING OR NEW FINISH, INCLUDING ANY FIRE RATINGS REQUIRED.
- ALL AREAS OF FLOORS, WALLS AND CEILINGS DISTURBED BY DEMOLITION SHALL BE FILLED, PATCHED OR OTHERWISE REFINISHED TO MATCH EXISTING OR NEW FINISH AS DESIGNATED, INCLUDING ALL REQUIRED RATINGS.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF ALL EXISTING STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL ELEMENTS PRIOR TO START OF DEMOLITION.

DEMOLITION KEY NOTES

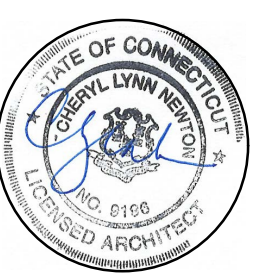
- D.1** REMOVE EXISTING BUILT-IN UNIT VENTILATOR IN ITS ENTIRETY. PRIOR TO DEMOLITION, CONTRACTOR IS TO CONFIRM CONDITION OF FINISH FLOORING BELOW CABINETS.
- D.2** REMOVE EXISTING ALUMINUM LOUVERS.
- D.3** REMOVE PORTION OF ACOUSTIC CEILING PANELS AS REQUIRED BY NEW WORK. CONTRACTOR TO SAVE ALL EXISTING PANELS FOR REUSE IN EXISTING LOCATIONS. ALL DAMAGED TILES SHALL BE REPLACED UPON REINSTALLATION. TYPICAL ALL CLASSROOMS
- D.4** REMOVE PORTION OF ACOUSTIC CEILING GRID AS REQUIRED BY INSTALLATION OF NEW STRUCTURAL BRACING UNDER NEW ROOF-MOUNTED HVAC UNITS.
- D.5** REMOVE PORTION OF EXISTING ROOF AS REQUIRED BY NEW HVAC DUCT WORK PENETRATIONS.
- D.6** REMOVE PORTION OF EXISTING FLOORING AS REQUIRED BY REMOVAL OF FLOOR-MOUNTED VENTILATORS. IN CLASSROOMS WHERE ACM IS PRESENT, ALL ACM SHALL BE REMOVED IN ITS ENTIRETY PRIOR TO INSTALLING NEW FLOORING MATERIAL. REMOVAL SHALL BE LIMITED TO EACH CLASSROOM AND SHALL NOT EXTEND INTO ADJACENT CORRIDORS.
- D.6** REMOVE WALL-MOUNTED STEAM CONVECTOR COVERS

FLOOR LEGEND

----- EXISTING CONSTRUCTION TO BE REMOVED

D.1 KEY DEMOLITION NOTE

0 DEMOLITION PLAN
 1/8" = 1'-0"



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 39 New London Turnpike, Suite 320
 Glastonbury, CT 06033
 Tel. (860) 633-2477
 www.cnarchitectsllc.com

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REVISIONS:

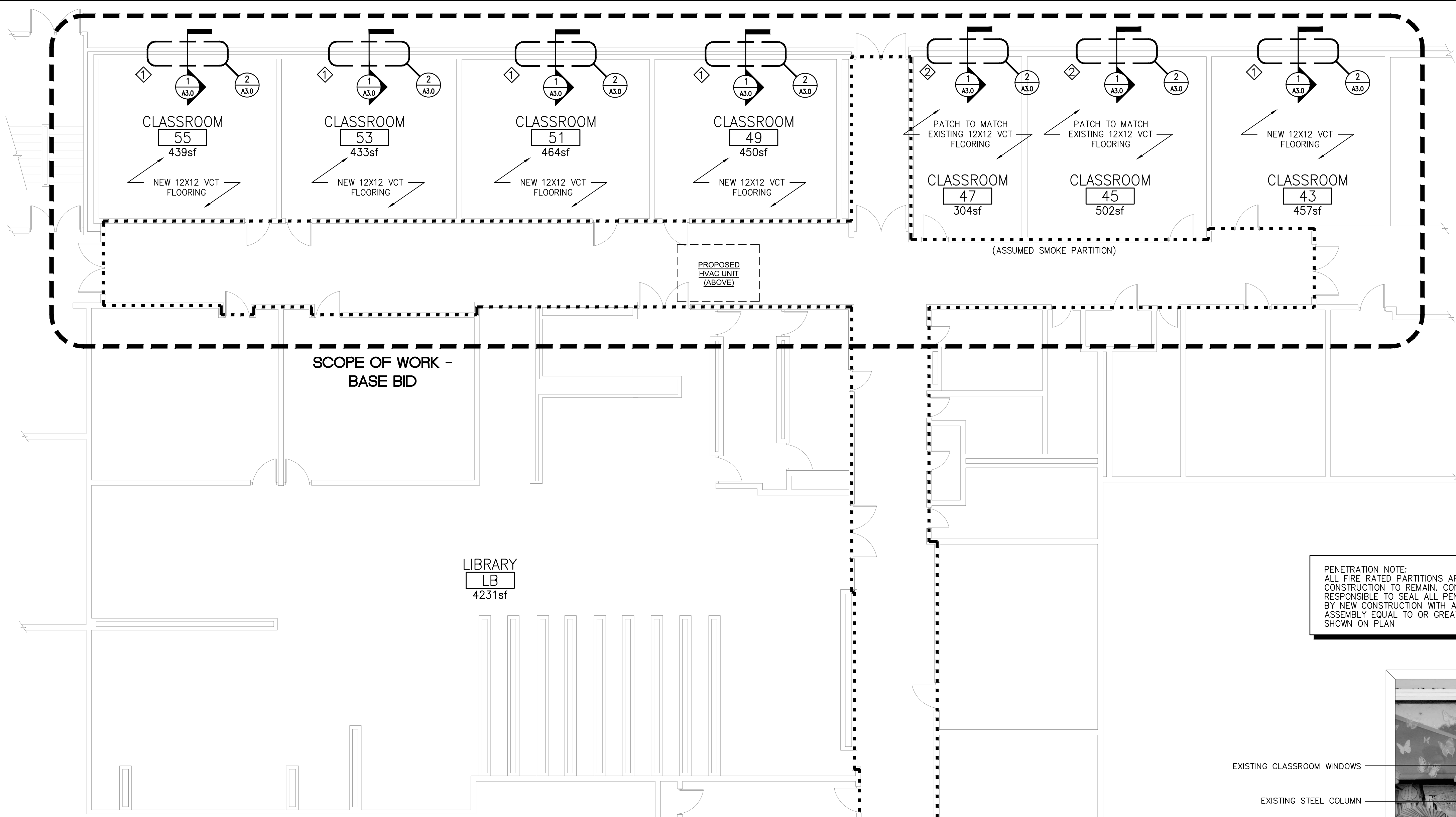
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TOWN OF CHESHIRE
 HVAC IMPROVEMENTS AT
 CHESHIRE HIGH SCHOOL
 525 South Main Street
 Cheshire, CT 06410

PROJECT SEQ: RFP # 2322-10
 PLOT SHEET SIZE: 24" x 36"
 FILE NAME:
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 DROPPBOX\CNAIA\TEAM FOLDER\2021
 PROJECTS\21-27 CHESHIRE HIGH SCHOOL\21-27
 DRAWINGS\21-27-04 CONSTRUCTION
 DOCUMENTS\GIS\GD11\02-22- ARCHITECTURAL

AUTHOR: CN
 DRAFTER: PS
 SCALE: AS NOTED
 PRINT DATE: 02-04-2022
 SHEET TITLE:
Demolition Plan & Notes

SHEET NUMBER:
A0.0
 SHEET SEQUENCE: ___ of ___



FIRE STOPPING & SMOKE STOPPING INFO

1-HOUR RATED FIRE STOPPING SYSTEM – UL SYSTEM NO. W-J-7029 (SQUARE DUCT) OR W-J-7124 (ROUND DUCT); METAL DUCT THROUGH CONCRETE MASONRY WALL. THE BASIS OF DESIGN: PRODUCT – FS-ONE AS MANUFACTURED BY HILTI, INC. FOR A 1 HOUR RATED WALL.

1-HOUR RATED FIRE STOPPING SYSTEM – UL SYSTEM NO. W-J-1067; METALLIC PIPE THROUGH CONCRETE MASONRY WALL. THE BASIS OF DESIGN: PRODUCT – FS-ONE AS MANUFACTURED BY HILTI, INC. FOR A 1 HOUR RATED WALL.

SMOKE STOPPING: THE BASIS OF DESIGN: PRODUCT – CP 506 AS MANUFACTURED BY HILTI, INC.

CONSTRUCTION NOTES

1. PATCH & REPAIR EXISTING MASONRY @ WALL PENETRATIONS BEYOND UNIT VENTILATOR. NEW SLATE PANEL @ EXTERIOR LOUVER LOCATIONS.

2. CONTRACTOR TO CONFIRM EXTERIOR LOUVER LOCATIONS @ EXISTING HERMAN NELSON HEATER LOCATIONS.

PARTITION NOTES

--- SMOKE PARTITION (EXISTING CONSTRUCTION, ASSUMED)

— 1 HOUR RATED WALL (EXISTING CONSTRUCTION, ASSUMED)

— 2 HOUR RATED WALL (EXISTING CONSTRUCTION, ASSUMED)

PENETRATION NOTE:
ALL FIRE RATED PARTITIONS ARE EXISTING CONSTRUCTION TO REMAIN. CONTRACTOR IS RESPONSIBLE TO SEAL ALL PENETRATIONS CREATED BY NEW CONSTRUCTION WITH AN UL RATED ASSEMBLY EQUAL TO OR GREATER THAN RATING SHOWN ON PLAN



EXISTING CLASSROOM WINDOWS

EXISTING STEEL COLUMN

EXISTING UNIT VENTILATOR LOUVERS TO BE REMOVED

3 EXISTING LOUVER (FOR REFERENCE) NTS



EXISTING WOOD-FRAMED, BUILT-IN CABINERY TO BE REMOVED

EXISTING MASONRY WALL

EXISTING FOIL WRAPPED INSULATION BOARD @ MASONRY OPENING

EXISTING RADIATOR PLUMBING

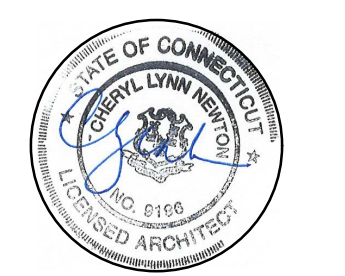
EXISTING 1'-0" x 1'-0" CEILING GRID TO REMAIN. CONTRACTOR TO PATCH AND REPAIR AS REQUIRED BY SCOPE OF WORK

2 EXISTING WALL DETAIL @ UNIT VENTILATOR (FOR REFERENCE) NTS

1 PROPOSED PLAN 1/8" = 1'-0"

GENERAL CONSTRUCTION NOTES

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL CURRENT NATIONAL, STATE, LOCAL CODES & ORDINANCES.
- DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING DIMENSIONS IN FIELD BEFORE CONTINUING WITH CONSTRUCTION. CONTRACTOR SHALL NOTIFY ARCHITECT AND OWNER'S REPRESENTATIVE IF THERE ARE ANY DISCREPANCIES.
- CONTRACT DRAWINGS MAY VARY FROM ACTUAL FIELD CONDITIONS. CONTRACTOR SHALL CORRECT DIMENSIONS OF ALL MATERIALS TO CARRY OUT THE INTENT OF THE CONTRACT DRAWINGS. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN FIELD BEFORE ORDERING ANY MATERIALS. CONTRACTOR SHALL NOTIFY ARCHITECT PROMPTLY OF ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
- ALL NEW WORK SHALL BE IMPLEMENTED SO AS TO PROVIDE A SMOOTH AND CONTINUOUS SURFACE WITH ALL EXISTING CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY TO ACHIEVE THIS REQUIREMENT, EVEN THOUGH PROCEDURES ARE NOT DETAILED FOR EACH SPECIFIC CONDITION OR COMBINATION OF CONDITIONS. QUALITY OF WORKMANSHIP, MATERIALS AND FINISHES SHALL BE EQUAL TO THE LEVEL ESTABLISHED FOR SIMILAR CONSTRUCTION, EXCEPT WHERE EXISTING APPEARANCE IS TO BE MATCHED TO ACHIEVE CONTINUITY.
- CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE TRADE WHOSE WORK RESULTS IN THE NEED FOR CUTTING AND PATCHING UNLESS A SPECIFIC CONTRACTOR IS CALLED OUT ON THE DRAWINGS. ALL HOLES LEFT BY REMOVING MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT, ETC. SHALL BE PATCHED.
- PREPARE EXISTING WALLS, FLOORS, AND CEILINGS AS REQUIRED FOR NEW FINISHES.
- ALL ITEMS NOTED AS SALVAGE SHALL BE REMOVED, PROTECTED AND TURNED OVER TO THE OWNER.
- ALL OPENINGS WHERE EXISTING CONSTRUCTION HAS BEEN REMOVED, AND WHICH ARE NOT NOTED TO REMAIN, SHALL BE FILLED AND / OR PATCHED TO MATCH THE ADJACENT EXISTING OR NEW FINISH, INCLUDING ANY FIRE RATINGS REQUIRED.
- ALL AREAS OF FLOORS, WALLS AND CEILINGS DISTURBED BY DEMOLITION SHALL BE FILLED, PATCHED OR OTHERWISE REFINISHED TO MATCH EXISTING OR NEW FINISH AS DESIGNATED, INCLUDING ALL REQUIRED RATINGS.
- CONTRACTOR MUST VERIFY LOCATIONS OF ALL EXISTING STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL ELEMENTS PRIOR TO START OF DEMOLITION.



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STATUS:
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REVISIONS:

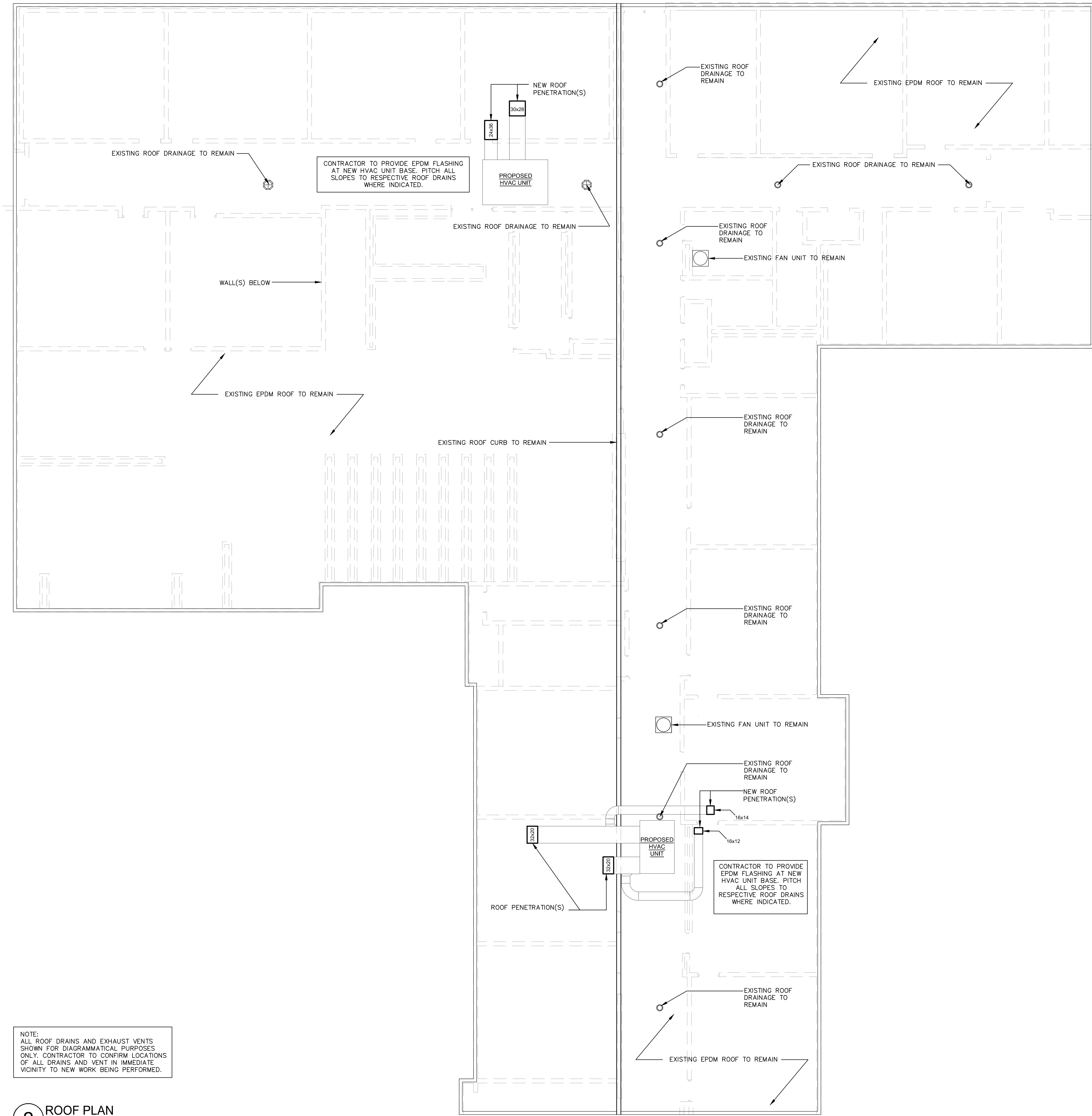
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TOWN OF CHESHIRE
HVAC IMPROVEMENTS AT
CHESHIRE HIGH SCHOOL
525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2322-10
PLOT SHEET SIZE: 24" x 36"
FILE NAME:
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DROPPROX\CNAAA\TEAM FOLDER\2021
PROJECTS\21-27 CHESHIRE HIGH SCHOOL\21-27
DRAWINGS\21-27-04 CONSTRUCTION
DOCUMENTS\GIS\CD\11-02-22 - ARCHITECTURAL

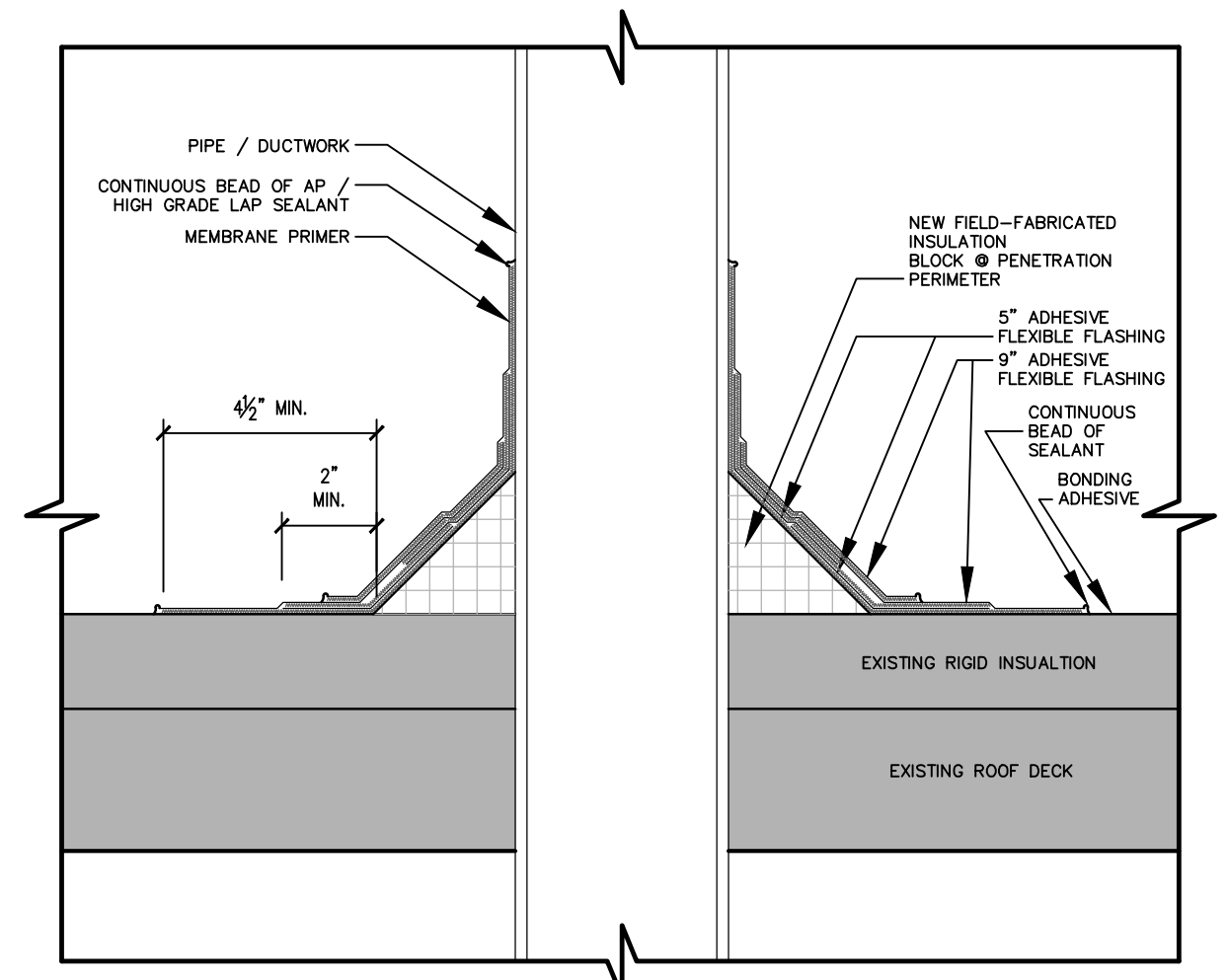
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DRAFTER: PS
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:
Floor Plan &
Construction Notes

SHEET NUMBER:
A1.0
SHEET SEQUENCE: ___ of ___



NOTE:
ALL ROOF DRAINS AND EXHAUST VENTS SHOWN FOR DIAGRAMMATICAL PURPOSES ONLY. CONTRACTOR TO CONFIRM LOCATIONS OF ALL DRAINS AND VENT IN IMMEDIATE VICINITY TO NEW WORK BEING PERFORMED.

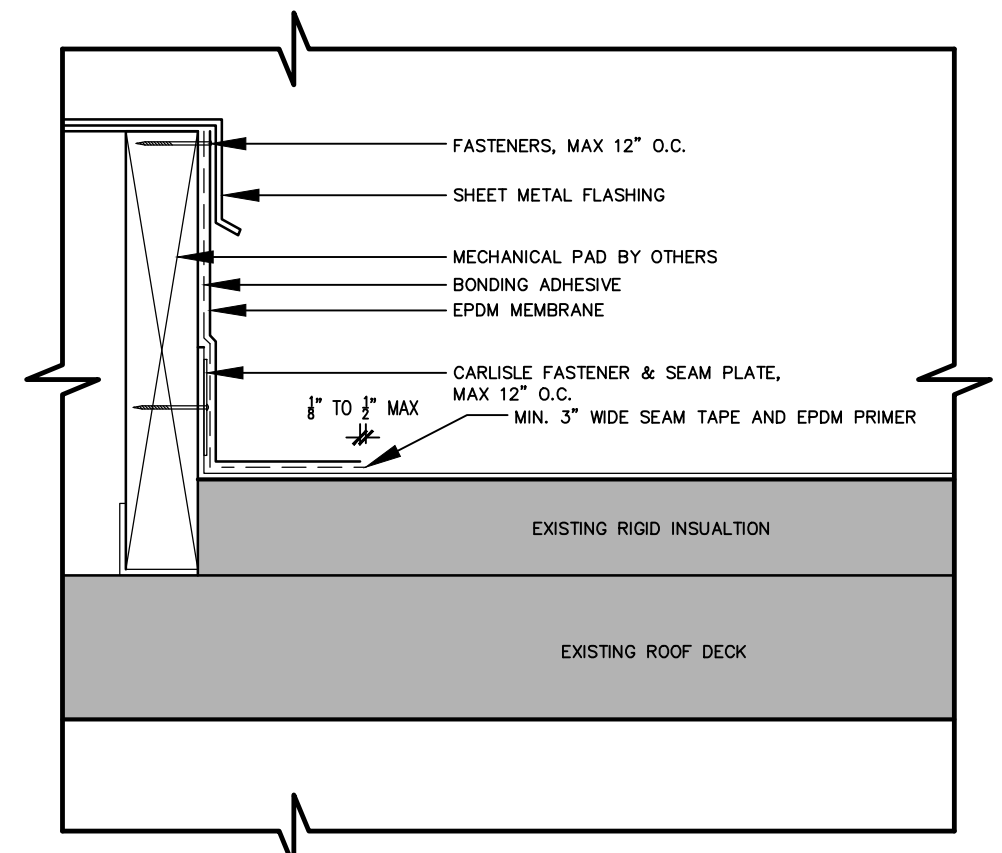
2 ROOF PLAN
1/8" = 1'-0"



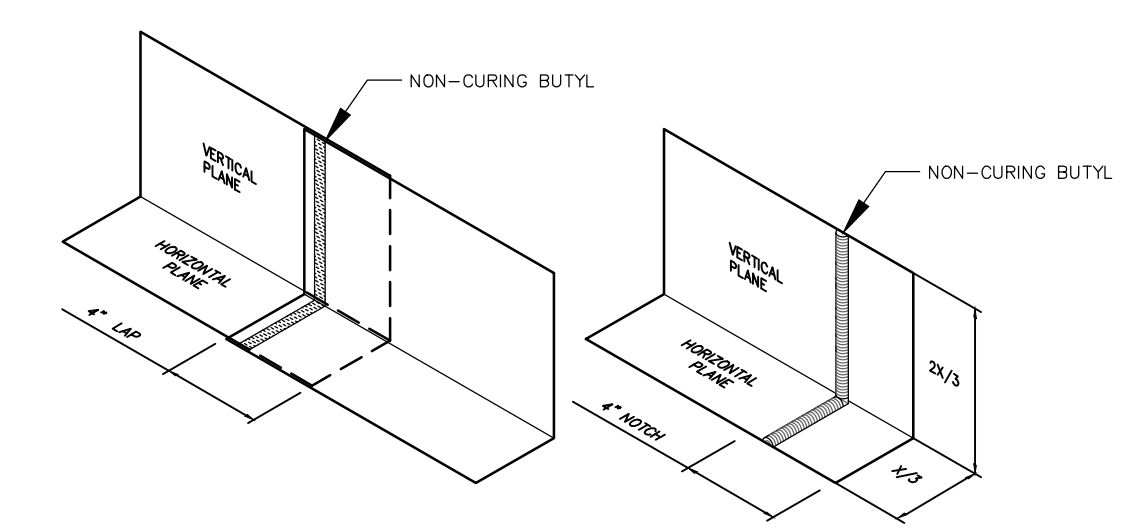
3 TYPICAL ROOF PENETRATION FLASHING DETAIL
3" = 1'-0"

- PENETRATION NOTES:**
- REMOVE ALL EXISTING FLASHINGS, LEADS, ETC. PIPE / DUCT SURFACES MUST BE FREE OF ALL DEBRIS, GREASE, AND INSULATION. DUCT MUST BE ANCHORED TO STRUCTURE ADJACENT TO ENSURE STABILITY.
 - CLAMPING RING AROUND TOP OF FORM FLASH IS NOT ACCEPTABLE.
 - WHEN OUTSIDE PERIMETER EXCEEDS 18", ADDITIONAL FIELD MEMBRANE SECUREMENT REQUIRED.

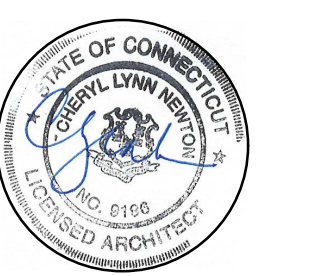
- CURB FLASHING NOTES:**
- WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATERCUT-OFF MASTIC UNDER COUNTER-FLASHING OR CAULK ALL FASTENER HEADS.
 - LAP SEALANT IS REQUIRED ON CUT-EDGES OF REINFORCED MEMBRANES.
 - SEAM PLATES AND FASTENERS MAY BE INSTALLED INTO THE STRUCTURAL DECK AND THEM HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED FOR MECHANICALLY-FASTENED ROOFING SYSTEMS OVER STEEL DECKS.
 - MEMBRANE SPLICES SHALL INCORPORATE 6" WIDE TAPE FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES.
 - REFER TO MANUFACTURER LITERATURE FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.



4 CURB DETAIL
3" = 1'-0"



5 ISOMETRIC VIEW OF TYPICAL FLASHING LAP
NTS



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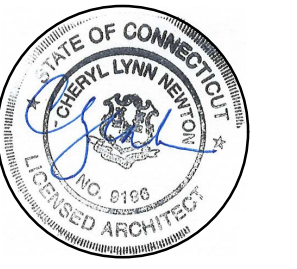
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525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2322-10
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PROJECTS\21-27-CHESHIRE HIGH SCHOOL\21-27
DRAWINGS\21-27-04 CONSTRUCTION
DOCUMENTS\GIS\GD 11-02-22 - ARCHITECTURAL
AUTHOR: CN
DRAFTER: PS
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:
Roof Plan & Roof
Penetration Details
SHEET NUMBER:

A2.0

SHEET SEQUENCE: ___ of ___



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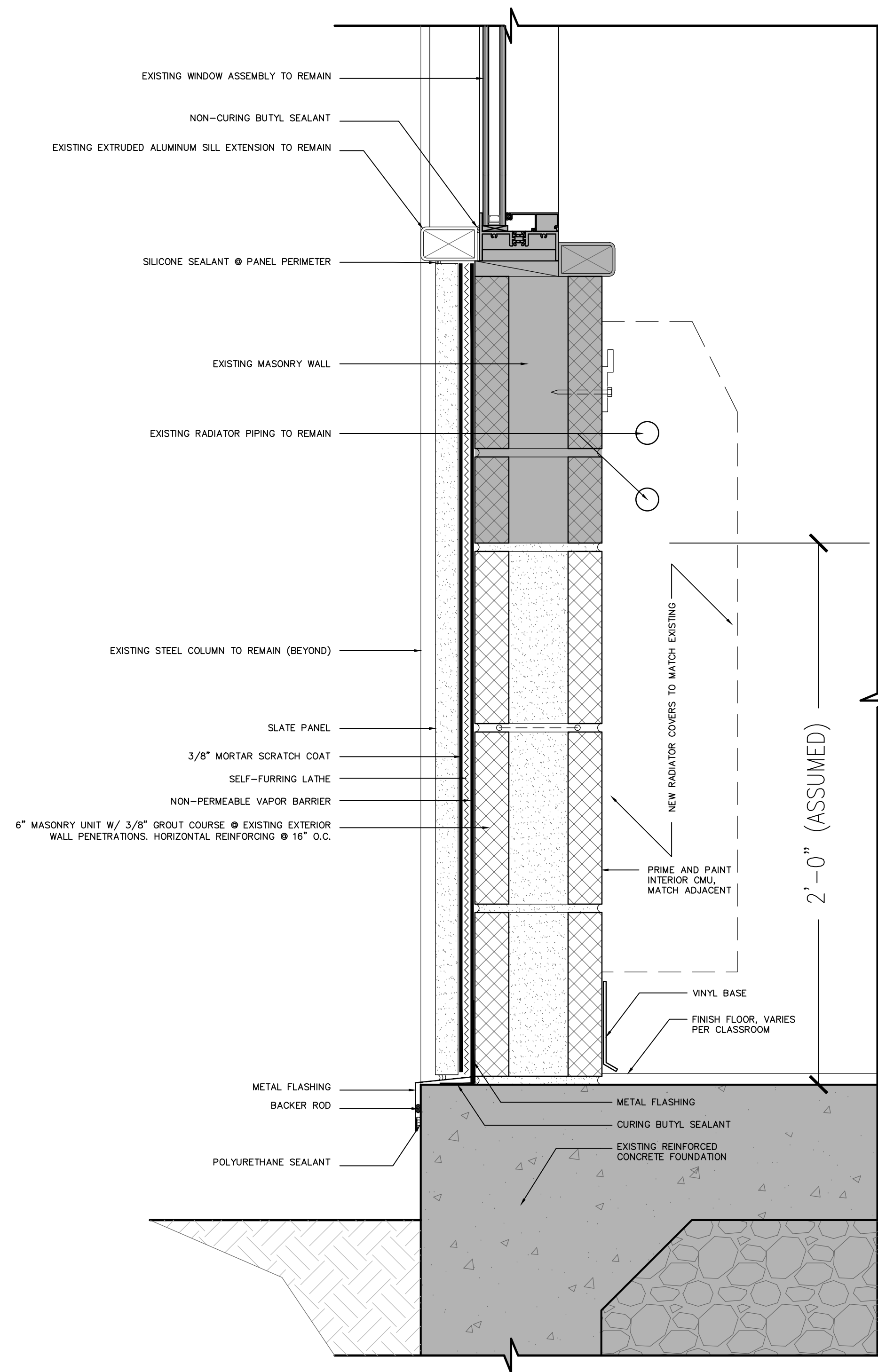
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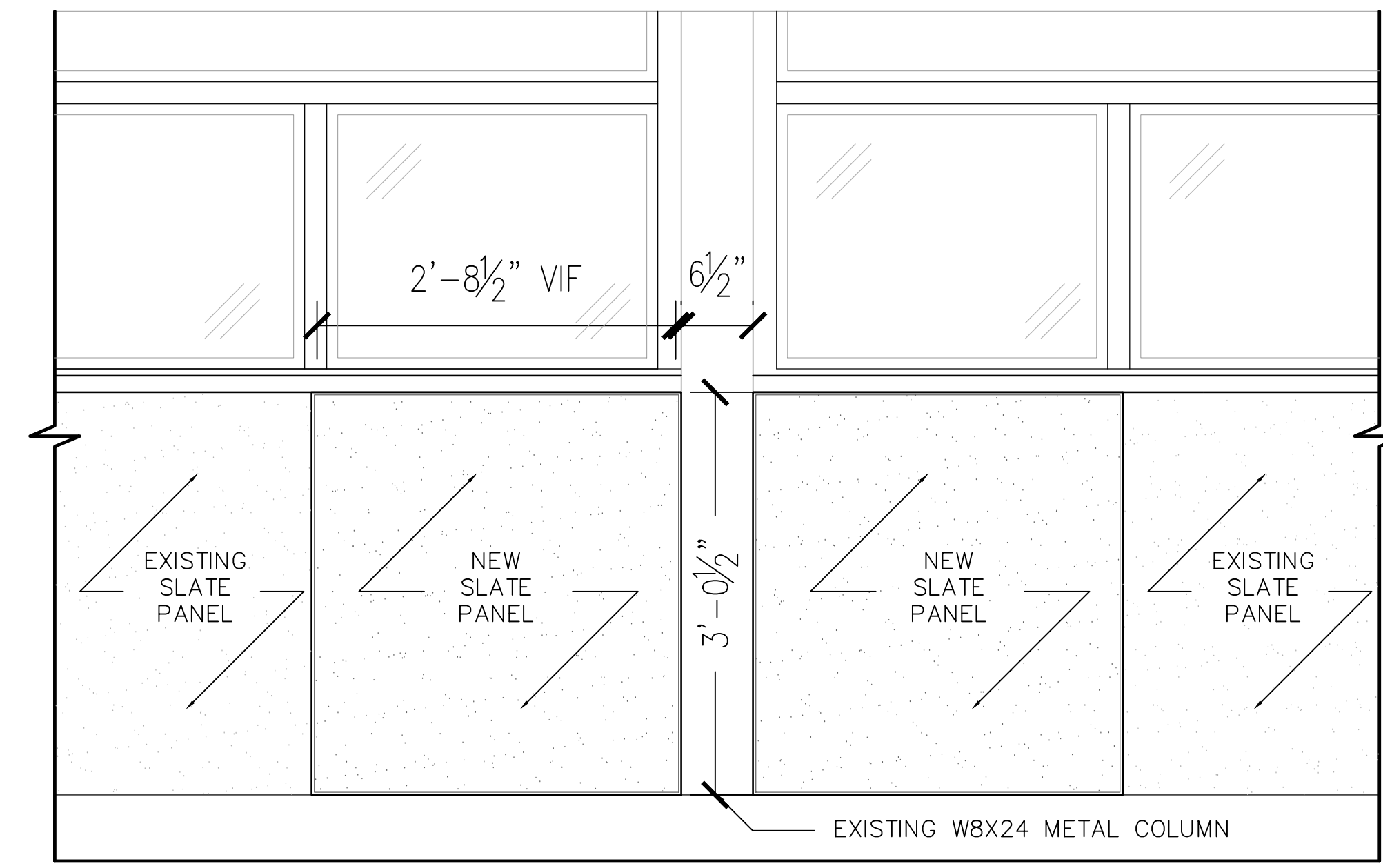
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 PROJECTS\21-27-04 CHESHIRE HIGH SCHOOL\21-27
 DRAWINGS\21-27-04 CONSTRUCTION
 DOCUMENTS\GIS\GD11\02.22-ARCHITECTURAL

AUTHOR: CN
 DRAFTER: PS
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 PRINT DATE: 02-04-2022
 SHEET TITLE:
 Wall Section &
 Ceiling Details

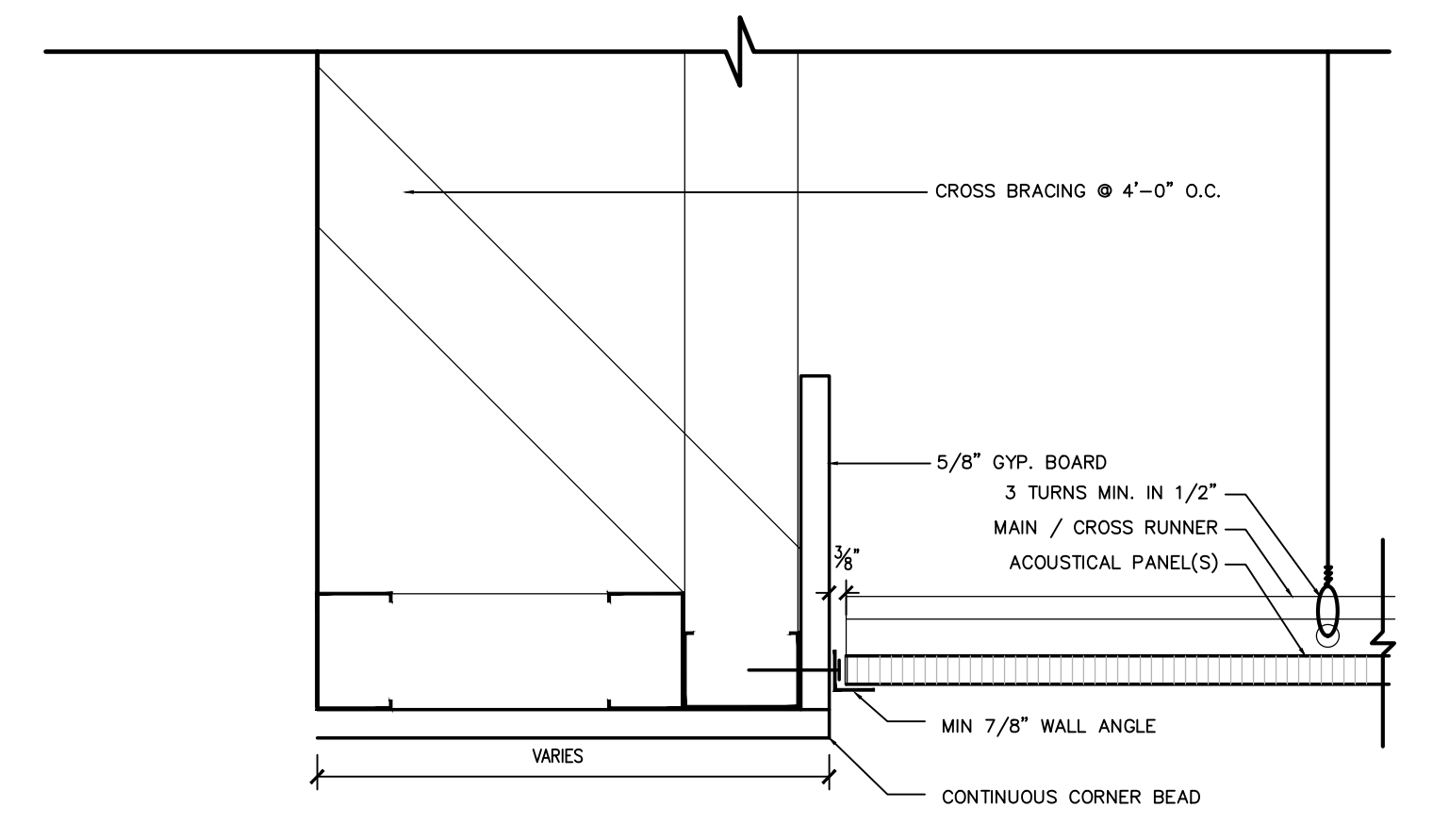
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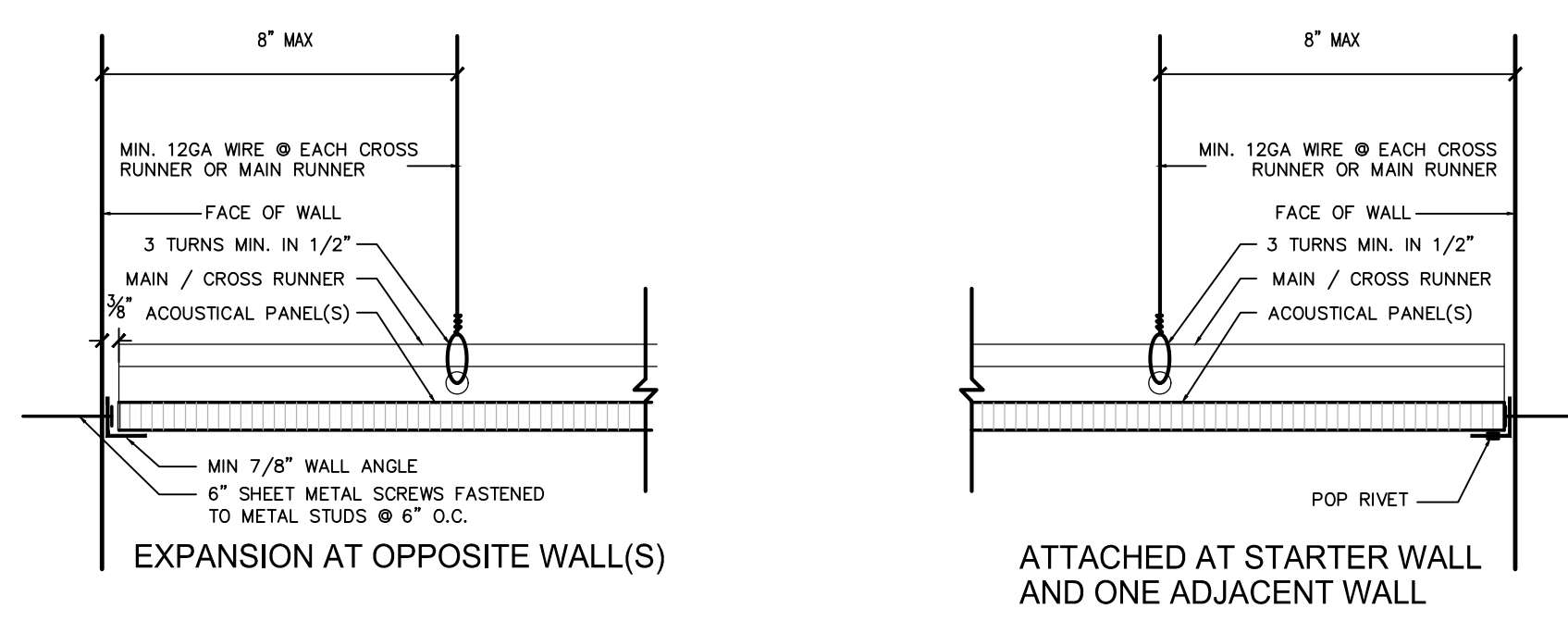
1 PANEL / SILL DETAIL
 3" = 1'-0"
 ■ EXISTING CONSTRUCTION TO REMAIN



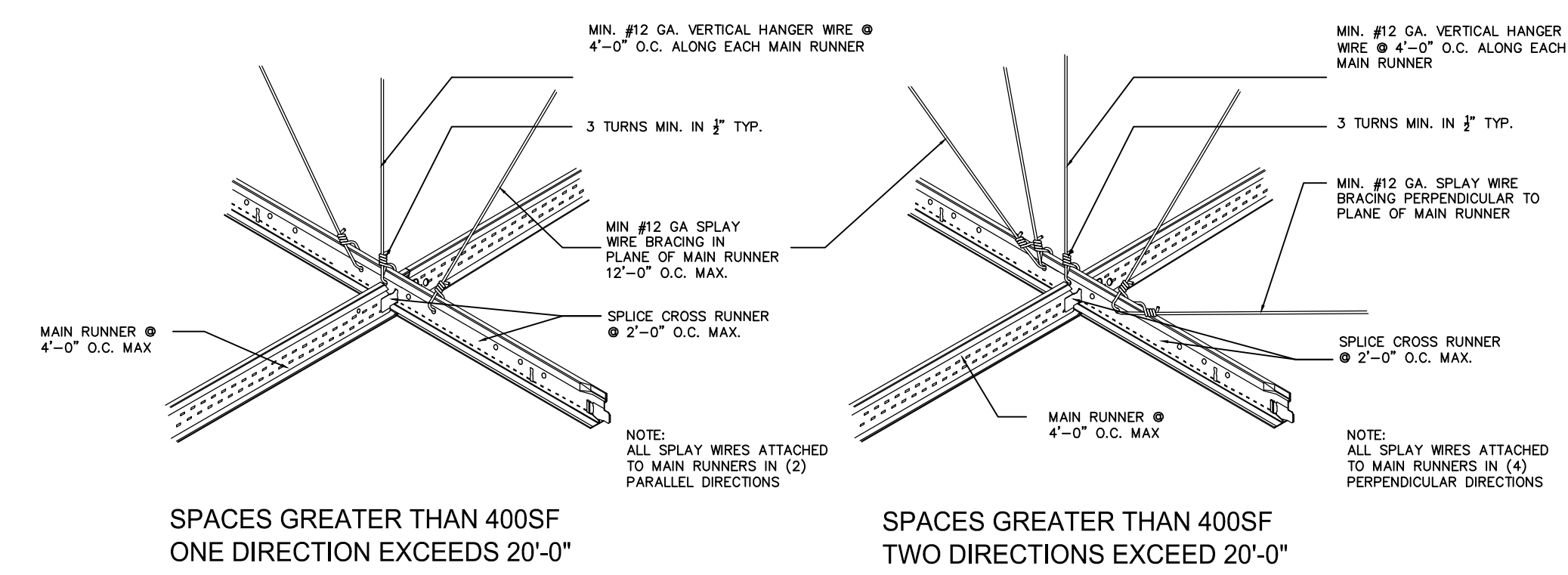
2 INSULATED METAL PANEL EXTERIOR ELEVATION
 1" = 1'-0"



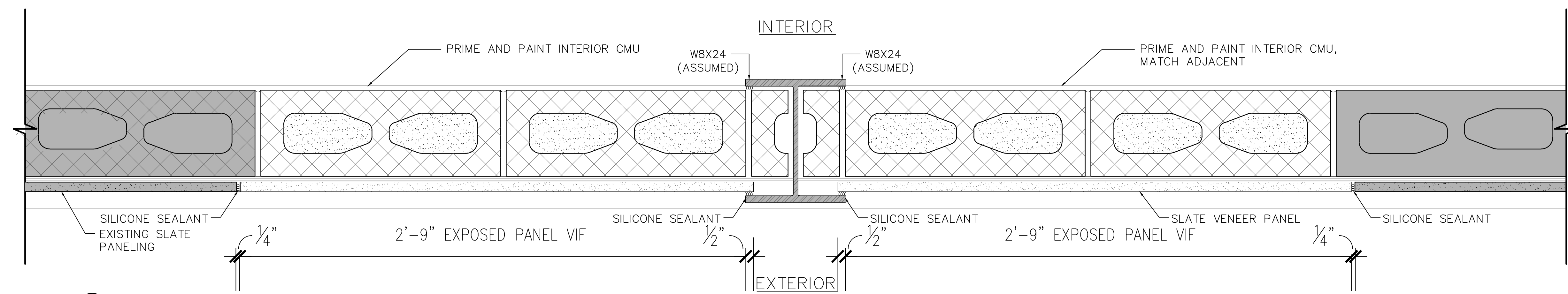
3 TYP. CEILING DETAIL @ SOFFIT
 3" = 1'-0"



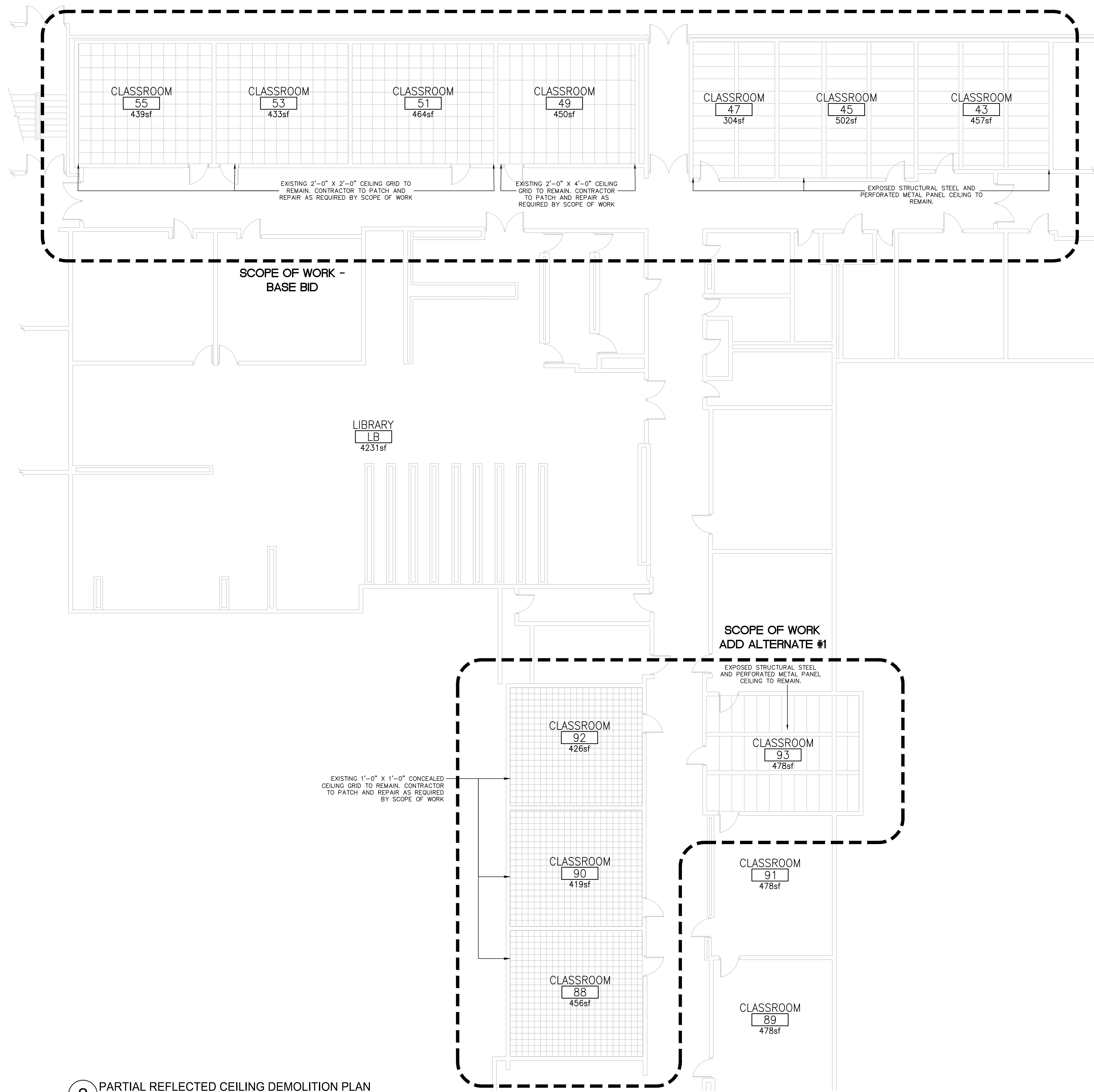
4 TYP. CEILING DETAILS @ WALL
 3" = 1'-0"



5 TYP. SEISMIC BRACING CEILING DETAIL
 N.T.S.



2 PANEL DETAIL
 3" = 1'-0"

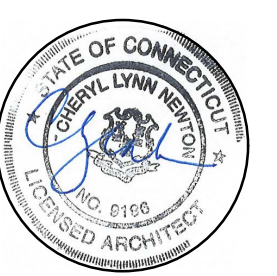


GENERAL CEILING NOTES

- SUSPENDED CEILING SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT STATE BUILDING CODES AND ALL APPLICABLE REFERENCED STANDARDS.
- SUSPENSION SYSTEM COMPONENTS FOR ACOUSTICAL PANEL CEILINGS SHALL BE MINIMUM OF ASTM C635 INTERMEDIATED DUTY CLASSIFICATION. INSTALLATION SHALL BE AS INDICATED AND AND IN ACCORDANCE WITH ASTM C635 AND ASTM E580.
- DESIGN OF SYSTEM COMPONENTS SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER FOR LOADING CONDITIONS INDICATED IN ACCORDANCE WITH ASTM C635. SUBMIT CERTIFICATE OF COMPLIANCE AS SPECIFIED.
- LATERAL LOADING AND SEISMIC RESTRAINTS SHALL BE COMPUTED PER THE CURRENT STATE OF CONNECTICUT BUILDING CODE.
- UNLESS OTHERWISE APPROVED SPLAY BRACING SHALL BE PROVIDED 12'-0" O.C. MAXIMUM, WITH THE FIRST POINT WITHIN 4'-0" OF THE WALL(S).
- ALL SUSPENSION WIRES SHALL BE A MINIMUM OF 6" CLEAR OF UNBRACED DUCTS, PIPING, ETC.
- HANGER WIRES SHALL BE PROVIDED WITHIN 8" OF WALL ANGLES FOR ALL MAIN AND CROSS RUNNERS.
- MAIN AND CROSS RUNNERS SHALL BE ATTACHED TO WALL ANGLE AT A STARTER WALL AND ONE ADJACENT WALL WITH THE OPPOSITE WALLS FREE TO MOVE AS INDICATED. WALL ANGLES SHALL HAVE NO STRUCTURAL VALUE.
- HANGERS SHALL BE SECURELY ATTACHED TO THE STRUCTURE ABOVE. WIRE HANGERS SHALL BE 12 GA MINIMUM AND TIED TO THE MAIN RUNNERS.
- SPLAY BRACING SHALL BE ATTACHED TO THE MAIN RUNNER ONLY.
- ALL ITEMS OF EQUIPMENT NOT PART OF THE SUSPENSION SYSTEM SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING. SUCH ITEMS INCLUDE, BUT ARE NOT LIMITED TO LIGHT FIXTURES, DIFFUSERS, GRILLES, SPEAKERS, PIPING AND DUCTWORK.
- CEILING SUSPENSION SYSTEMS SHALL NOT BE SUPPORTED BY/ OR CONNECTED TO DUCTWORK, PIPING, CONDUITS, ETC.

CEILING NOTES:

- 24"x24" ACT CEILING & GRID [ARMSTRONG 1729A]
 - INSTALL SUSPENDED ACOUSTICAL CEILING PANELS: [24"x24" MINERAL FIBER, SQUARE EDGE, 5/8" ACOUSTIC CEILING TILE, 0.55 NRC, WHITE] TO MATCH EXISTING 24"x24" CEILING IN INDICATED AREAS.
 - REPLACE DAMAGED OR AFFECTED CEILING GRID AS REQUIRED BY NEW WORK IN CLASSROOMS WITH 24"x24" CEILING PANELS. NEW GRID TO MATCH EXISTING: [ARMSTRONG PRELUDE XL 15/16" EXPOSED TEE ACOUSTICAL SUSPENSION SYSTEM]
- 24"x48" ACT CEILING & GRID [ARMSTRONG 860]
 - INSTALL SUSPENDED ACOUSTICAL CEILING PANELS: [24"x48" MINERAL FIBER, SQUARE EDGE, 5/8" ACOUSTIC CEILING TILE, 0.55 NRC, WHITE] TO MATCH EXISTING 24"x24" CEILING IN INDICATED AREAS.
 - REPLACE DAMAGED OR AFFECTED CEILING GRID AS REQUIRED BY NEW WORK IN CLASSROOMS WITH 24"x48" CEILING PANELS. NEW GRID TO MATCH EXISTING: [ARMSTRONG PRELUDE XL 15/16" EXPOSED TEE ACOUSTICAL SUSPENSION SYSTEM]
- 12"x12" ACT CEILING & CONCEALED GRID [ARMSTRONG 746]
 - INSTALL SUSPENDED ACOUSTICAL CEILING PANELS: [12"x12" MINERAL FIBER, BEVELED EDGE, 5/8" ACOUSTIC CEILING TILE, 0.55 NRC, WHITE] TO MATCH EXISTING 12"x12" CEILING IN INDICATED AREAS.
 - REPLACE DAMAGED OR AFFECTED CEILING GRID AS REQUIRED BY NEW WORK IN CLASSROOMS WITH 12"x12" CEILING PANELS. NEW GRID TO MATCH EXISTING: [ARMSTRONG PRELUDE CONCEALED]
- REPLACE STAINED OR DAMAGED CEILING TILES AS NEEDED THROUGHOUT SCOPE OF WORK, TYPICAL ALL ROOMS.



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ISSUED FOR BIDDING

REVISIONS:

MARK	DATE	DESCRIPTION
Δ		

TOWN OF CHESHIRE
 HVAC IMPROVEMENTS AT
 CHESHIRE HIGH SCHOOL
 525 South Main Street
 Cheshire, CT 06410

PROJECT SEQ: RFP # 2322-10
 PLOT SHEET SIZE: 24" x 36"

FILE NAME:
 C:\USERS\KNS\INTERN\ARCHITECT\CN\AIA
 DROPPBOX\CN\AIA\TEAM FOLDER\2021
 PROJECTS\21-27-CHESHIRE HIGH SCHOOL\21-27
 DRAWINGS\21-27-04 CONSTRUCTION
 DOCUMENTS\GIS\GD11-02-22-ARCHITECTURAL

AUTHOR: CN
 DRAFTER: PS
 SCALE: AS NOTED
 PRINT DATE: 02-04-2022

SHEET TITLE:
**Reflected Ceiling
 Plan & Ceiling Notes**

SHEET NUMBER:

A4.0

SHEET SEQUENCE: ___ of ___

ELECTRICAL GENERAL NOTES

- BRANCH CIRCUITS AND FEEDER CIRCUITS SHALL BE CONCEALED IN WALLS AND ABOVE CEILINGS WHERE POSSIBLE, INCLUDING HOMERUNS TO PANELBOARDS. BRANCH CIRCUITS AND FEEDERS SHALL NOT BE ROUTED IN OR UNDER SLAB UNLESS SPECIFICALLY INDICATED ON ELECTRICAL FLOOR PLANS OR DETAILS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- BRANCH CIRCUITS SHALL BE #12,#12G,#14C, TO NEW 20A/1P CIRCUIT BREAKER IN PANEL INDICATED UNLESS NOTED OTHERWISE.
- 120V, 1-PHASE, 20A BRANCH CIRCUITS EXCEEDING 150' IN LENGTH SHALL BE 2#10,#10G, 3/4"C. UNLESS NOTED OTHERWISE.
- DEVICES SHALL BE LABELED WITH SOURCE PANEL AND CIRCUIT NUMBER(S).
- PROVIDE FIRE STOPPING AND SMOKE BARRIER SEALING OF PENETRATIONS THROUGH FIRE WALLS OR SMOKE BARRIERS AS REQUIRED.
- COORDINATE LOCATIONS OF ELECTRICAL DEVICES AND CONTROLS WITH RESPECT TO LOCATIONS OF CASEWORK AND EQUIPMENT PRIOR TO ROUGH-IN
- WHEN DEVICES ARE SHOWN ON PLANS OFFSET FROM ONE ANOTHER, DEVICES SHALL BE MOUNTED IN LINE, CENTERED ON WALL.
- SHARED NEUTRAL WIRING IS NOT ACCEPTABLE, UNLESS NOTED OTHERWISE ON DRAWINGS. PROVIDE A DEDICATED NEUTRAL WIRE FOR EACH CIRCUIT, WHERE APPLICABLE.
- DRAWINGS ARE DIAGRAMMATIC ONLY. DO NOT SCALE ELECTRICAL DRAWINGS.
- FINISHES AND COLOR OF ELECTRICAL WIRING DEVICES, EXPOSED RACEWAY, LIGHT FIXTURES, AND OTHER ELECTRICAL DEVICES SHALL BE DETERMINED BY THE ARCHITECT
- ELECTRICAL WORK SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE (OTHER THAN ROOF DECK).
- THE ELECTRICAL CONTRACTOR SHALL PERFORM CORES REQUIRED FOR ELECTRICAL WORK.
- BUILDING WIRE AND CABLE NOT IN RACEWAY SHALL BE PLENUM RATED.

ELECTRICAL DEMOLITION NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL ITEMS TO BE REMOVED IN A SAFE, LEGAL AND RESPONSIBLE MANNER.
- CONTRACTOR SHALL MODIFY EXISTING CIRCUITS, WHEN EXISTING DEVICES ARE REMOVED, AS REQUIRED TO MAINTAIN CIRCUIT CONTINUITY.
- PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE AND HANDLING OF EXISTING TO BE RELOCATED EQUIPMENT AND DEVICES.
- BRANCH CIRCUITS THAT ARE EXISTING TO REMAIN OR TO BE RELOCATED IN PANELBOARDS THAT ARE BEING DEMOLISHED SHALL BE LABELED TO INDICATE WHAT THEY ARE SERVING (BASED ON EXISTING PANELBOARD DIRECTORY).
- PANELBOARDS THAT ARE EXISTING TO REMAIN SHALL HAVE THEIR DIRECTORY UPDATED TO INDICATE CIRCUITS THAT ARE EXISTING TO REMAIN. CIRCUITS THAT HAVE BEEN REMOVED AS PART OF DEMOLITION SHALL BE INDICATED IN THE REVISED DIRECTORY AS SPARES.

ELECTRICAL ABBREVIATIONS

A/AMP	AMPERE
AC	ALTERNATING CURRENT
AFCI	ARC FAULT CIRCUIT INTERRUPTER
ACU	AIR CONDITIONING UNIT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPS INTERRUPTING CURRENT
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BSMT	BASEMENT
C	CONDUIT
CATV	CABLE TELEVISION
C/B	CIRCUIT BREAKER
CKT	CIRCUIT
COMP	COMPRESSOR
CP	CONDENSATE PUMP
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT OR COPPER
CUH	CABINET UNIT HEATER
D	DRYER
DEG.	DEGREE
DN	DOWN
DNW	DRAWING
ETR	EXISTING TO REMAIN
EF	EXHAUST FAN
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMT	ELECTRIC METALLIC TUBING
EP	EMERGENCY PANEL
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EW	ELECTRIC WATER HEATER
F	FAHRENHEIT
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FC	FOOT CANDLE
FCU	FAN COIL UNIT
G	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HP	HORSE POWER
HPS	HIGH PRESSURE SODIUM
HR	HOUR
HZ	HERTZ
IG	ISOLATED GROUND
IN	INCHES
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
KW	KILOWATT
MAX	MAXIMUM
MAU	MAKE-UP AIR UNIT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MH	METAL HALIDE OR MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
NA	NOT APPLICABLE
NE	NEW DEVICE INSTALLED IN SAME LOCATION AS EXISTING REMOVED DEVICE
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NL	NEW LOCATION OF RELOCATED DEVICE
NR	NEW TO REPLACE EXISTING
NTS	NOT TO SCALE
P	POLE
PE	PRIMARY ELECTRIC SERVICE
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE CONDUIT
RE	EXISTING TO BE REMOVED
REF	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL CONDUIT
RL	EXISTING TO BE RELOCATED
ROOM	ROOM
RN	EXISTING TO BE REMOVED AND REPLACED WITH NEW (EXISTING BACKBOXES, CONDUIT AND WIRING TO REMAIN)
RR	EXISTING TO BE RELOCATED IN SAME LOCATION ON NEW SURFACE
RTU	ROOFTOP UNIT
SE	SECONDARY ELECTRICAL SERVICE
SPEC	SPECIFICATION
SWBD	SWITCHBOARD
SPD	SURGE PROTECTION DEVICE
TELE	TELECOMMUNICATIONS/TELEPHONE
TV	TELEVISION
T/TX	TRANSFORMER
TYP	TYPICAL
UH	UNIT HEATER
UN	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT AMPERE
VAC	VOLTS ALTERNATING CURRENT
VIF	VERIFY IN FIELD
W	WATT OR WIRE
WA	WASHER
WG	WIRE GUARD
WP	WEATHERPROOF

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
	SURFACE MOUNTED PANELBOARD
	DISCONNECT SWITCH
	MOTOR (REFER TO MOTOR CIRCUIT SCHEDULE FOR POWER REQUIREMENTS)
	BRANCH CIRCUIT WIRING, CONCEALED IN WALLS OR CEILINGS
	HOMERUN TO PANELBOARD
	SWITCHED BRANCH CIRCUIT WIRING
	JUNCTION BOX
	JUNCTION BOX LOCATED ABOVE CEILING FOR 120V/24V TRANSFORMER USED TO SUPPLY VARIABLE AIR VOLUME (VAV) BOXES. PROVIDE 20A/1P DEDICATED CIRCUIT AS SHOWN ON PLANS. COORDINATE EXACT LOCATION WITH DIV. 23 PRIOR TO INSTALLATION.
	DUPLEX WALL MOUNTED RECEPTACLE, 18" AFF UNLESS OTHERWISE NOTED
	RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTION
	RECEPTACLE WITH WEATHERPROOF COVER
	RECESSED LIGHTING FIXTURE
	SURFACE MOUNTED INDUSTRIAL OR STRIP TYPE FIXTURE
	CEILING MOUNTED OCCUPANCY SENSOR (SET TO AUTO-ON, AUTO-OFF MODE)
	DUCT MOUNTED SMOKE DETECTOR AND HOUSING
	FIRE ALARM CONTROL MODULE
	CEILING MOUNTED WIRELESS ACCESS POINT.
	CEILING MOUNTED CAMERA FOR VIDEO RECORDING
	DUCT SMOKE DETECTOR.



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TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS

525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21
2021248.00 - CHESHIRE HIGH SCHOOL - HVAC
ARCH\TITLE BLOCK

AUTHOR: MC/CB
DRAFTER: MC/CB
SCALE: AS NOTED
PRINT DATE: 02-04-2022
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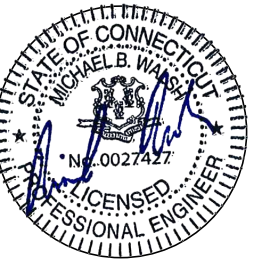
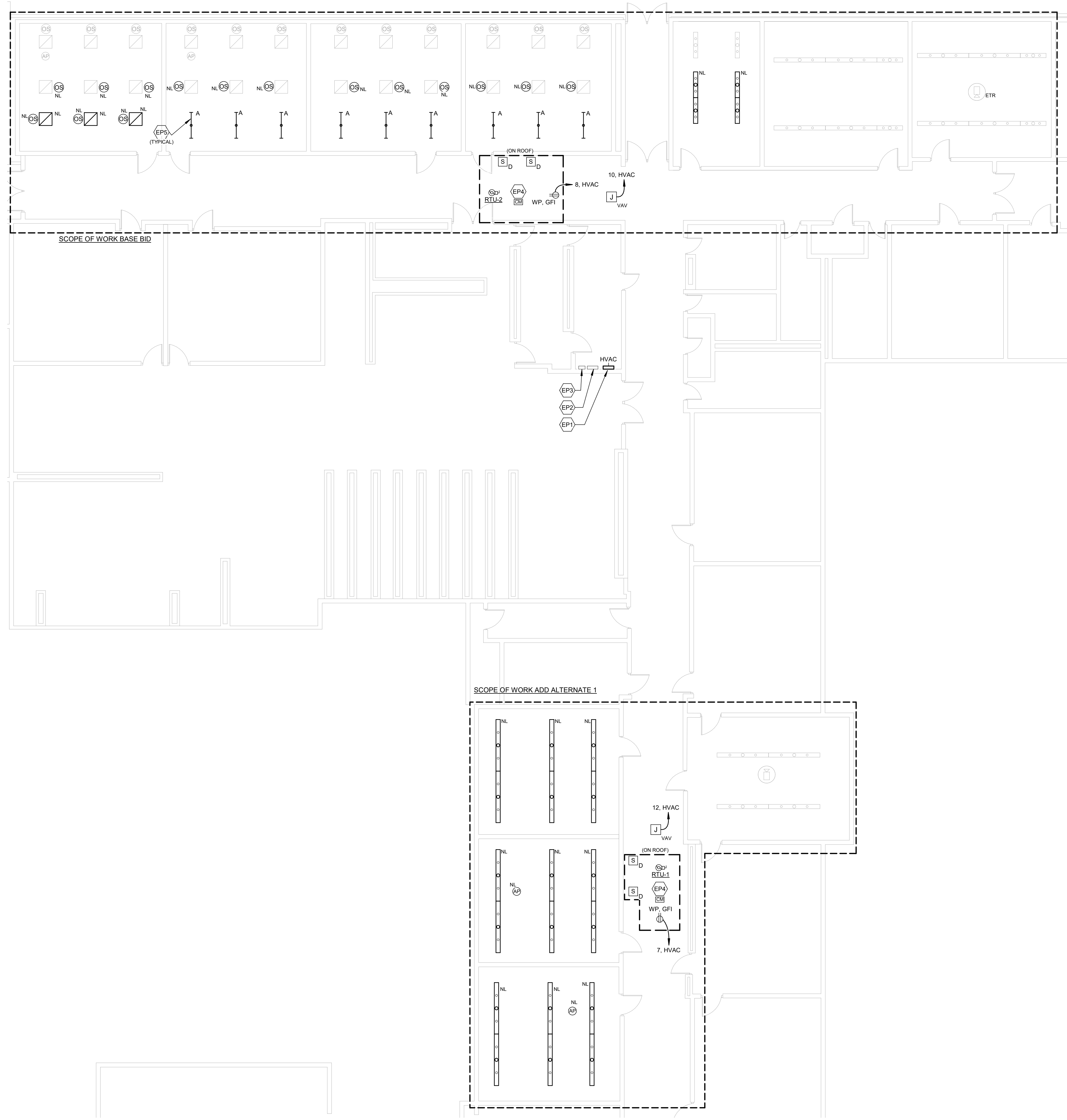
ELECTRICAL ABBREVIATIONS,
NOTES AND SYMBOLS

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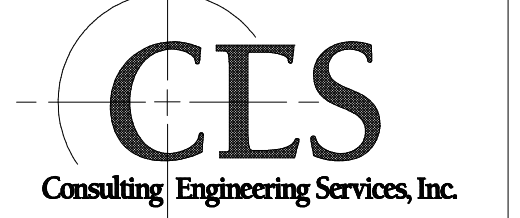
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ELECTRICAL POWER KEY NOTES

- EP1 NEW PANELBOARD "HVAC". EXTEND EXISTING ACTIVE (ENERGIZED) CIRCUITS TO THIS PANELBOARD. REFER TO ELECTRICAL RISER DIAGRAM AND PANELBOARD SCHEDULES FOR ADDITIONAL INFORMATION.
- EP2 INTERCEPT EXISTING PANELBOARD FEEDER AND EXTEND TO NEW PANEL "HVAC". REFER TO ELECTRICAL RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- EP3 EXISTING 150A, 208/120V, 3PH PANELBOARD TO REMAIN.
- EP4 PROVIDE CONTROL MODULE WIRED TO LOCAL FIRE ALARM INITIATION LOOP TO SHUTDOWN FAN UPON FIRE ALARM SYSTEM ACTIVATION. REFER TO FIRE ALARM RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- EP5 (TYPICAL) PROVIDE NEW LINEAR UTILITY STRIP LIGHT FIXTURE PER LIGHTING FIXTURE SCHEDULE. WIRE NEW FIXTURE TO EXISTING LIGHTING CIRCUIT WITHIN SPACE. PROVIDE 2#12, #125, 1/2" FROM EACH EXISTING LIGHTING FIXTURE LOCATION TO NEW LIGHT FIXTURE LOCATION, AS REQUIRED. FIXTURE SHALL BE MOUNTED TO UNISTRUT SUPPORT SUSPENDED FROM STRUCTURE, STRADDLING UNDERSIDE OF DUCTWORK. REFER TO DEMOLITION PLANS FOR EXISTING LIGHT FIXTURE LOCATIONS.



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TOWN OF CHESHIRE
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 525 South Main Street
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PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21
2021248.00 - CHESHIRE HIGH SCHOOL - HVAC
ARCH\TITLE BLOCK

AUTHOR: MC/CB
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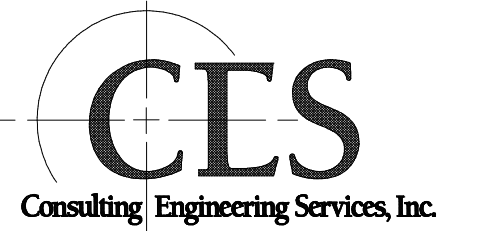
ELECTRICAL FLOOR PLAN

SHEET NUMBER:

E1.01



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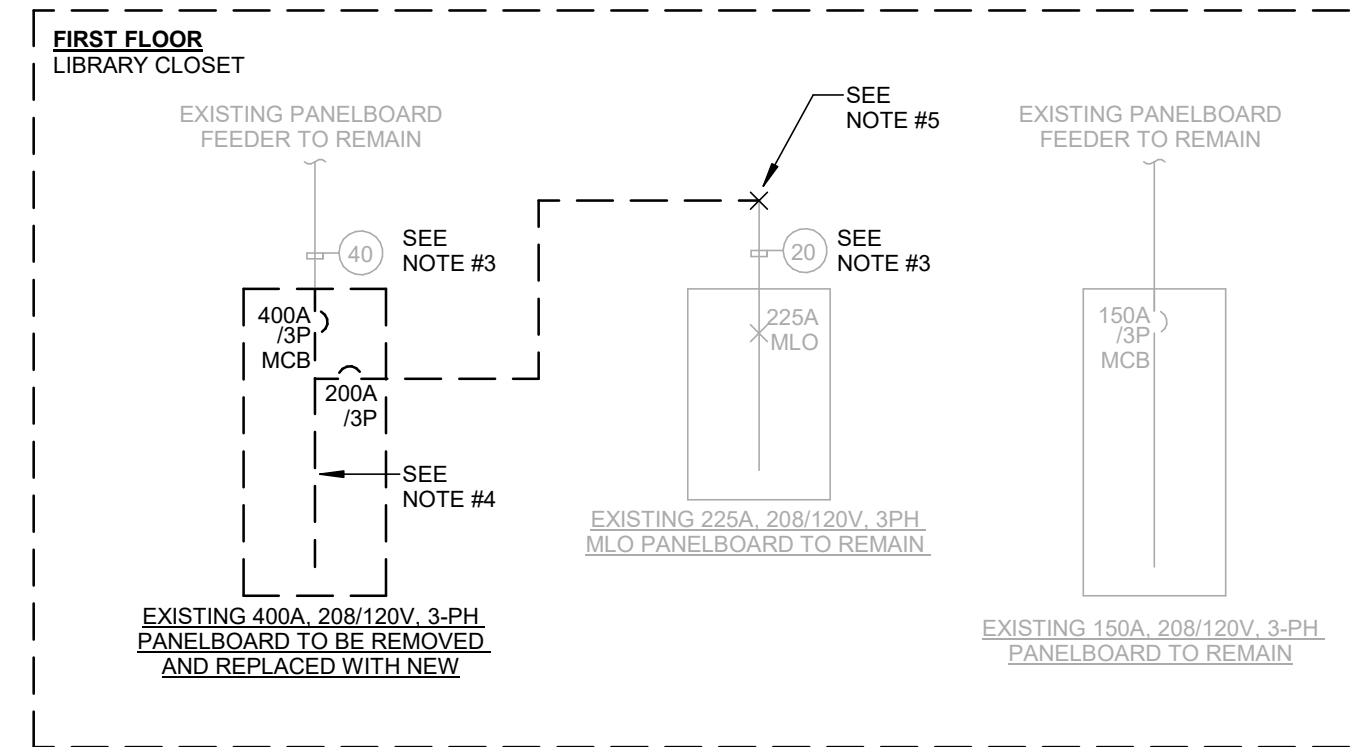
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DEMOLITION RISER DIAGRAM

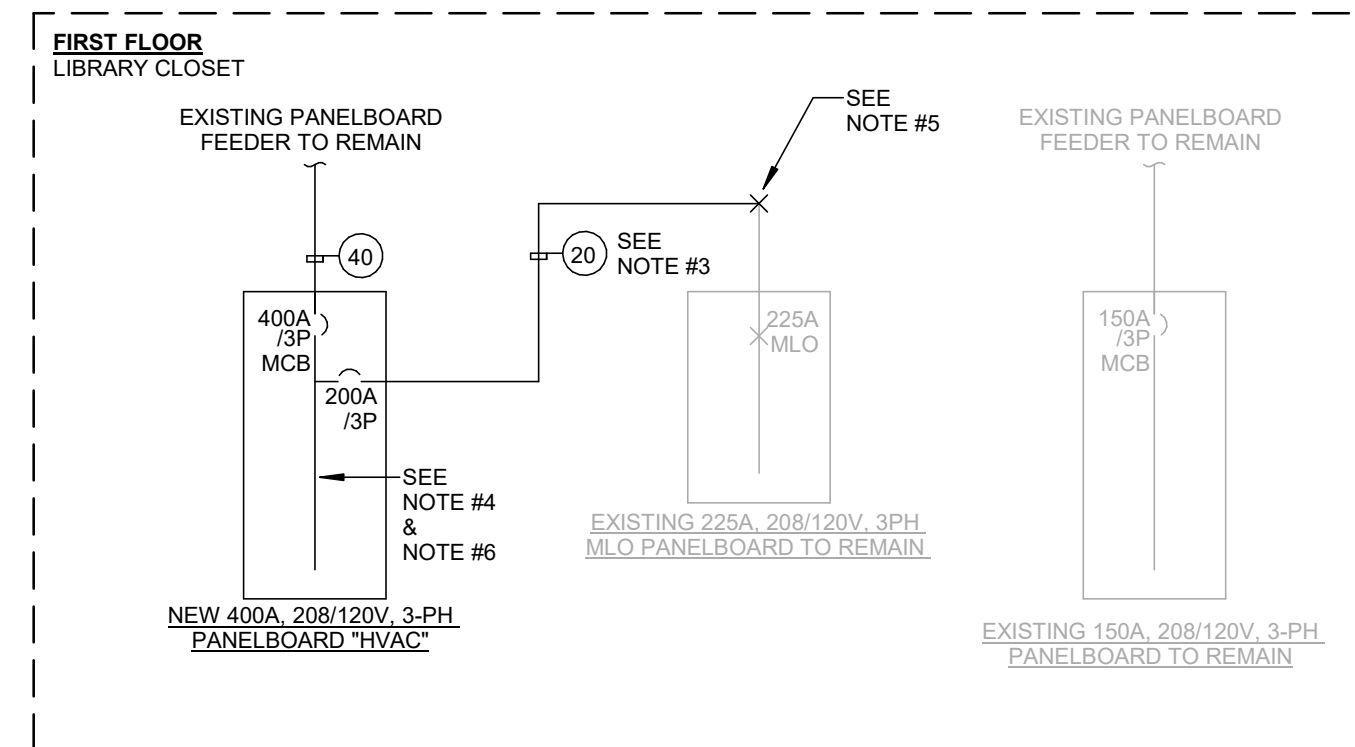


THREE PHASE COPPER FEEDER SCHEDULE

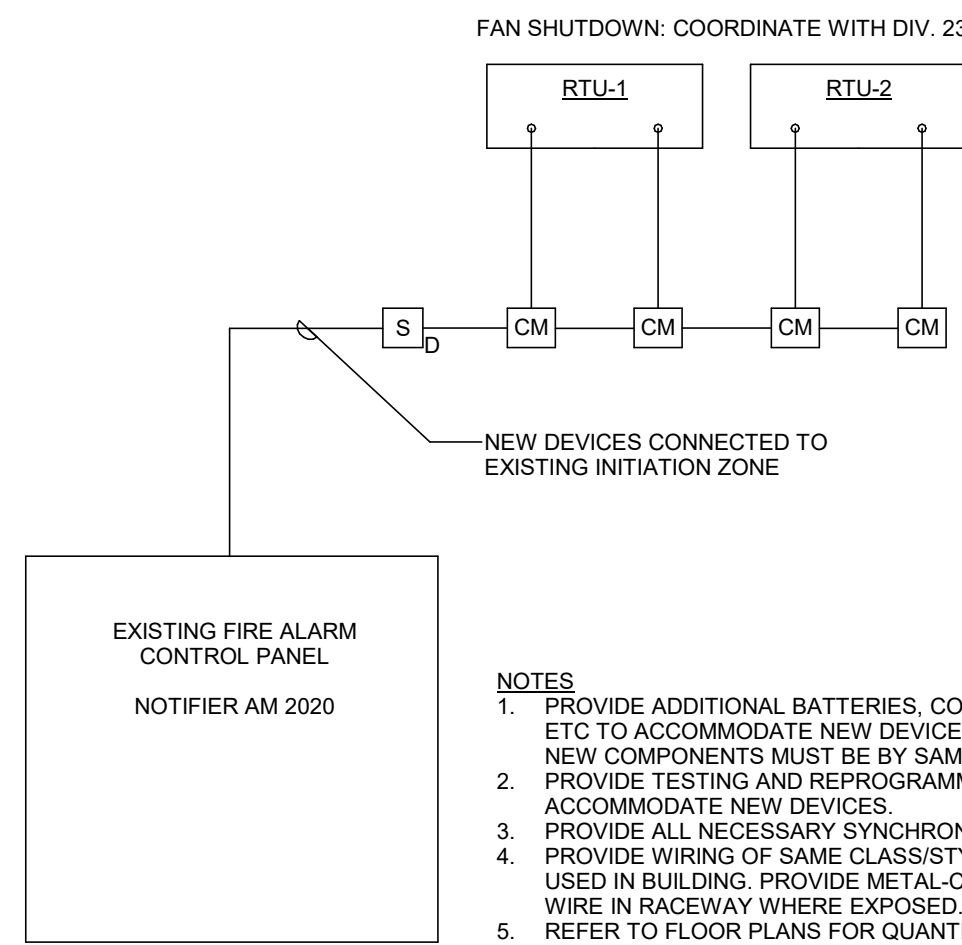
CIRCUIT SYMBOL	CONDUCTORS (3 PH, 3W) WITH GROUND	CONDUIT SIZE	CONDUCTORS (3 PH, 4W) WITH GROUND	CONDUIT SIZE	OVERCURRENT RATING
(20)	3#3/0 & 1#6G	2-1/2"	4#3/0 & 1#6G	2-1/2"	200A
(40)	3#600KCMIL & 1#3G	4"	4#600KCMIL & 1#3G	4"	400A

- NOTES:
- UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED ABOVE FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CONDUCTORS AND CONDUIT WHERE INDICATED, OR AS REQUIRED BY CODE.
 - CONDUIT SIZES IN THIS TABLE REFLECT THE REQUIREMENTS OF NEC INFORMATIVE ANNEX "C", TABLE C.1.
 - PROVIDE A 4-WIRE CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL.
 - REFER TO PANELBOARD SCHEDULES AND MOTOR CIRCUIT SCHEDULE (WHERE APPLICABLE) FOR CONDUCTOR AND CONDUIT SIZE REQUIREMENTS FOR OTHER MOTOR LOADS NOT SHOWN ON ONE LINE DIAGRAM.
 - CONDUCTOR SIZES ARE BASED ON 60°C WHERE AMPACITY IS LESS THAN OR EQUAL TO 100A AND 75°C WHERE AMPACITY IS GREATER THAN 100A. ALL EQUIPMENT AND CONDUCTOR TERMINATIONS CONNECTED TO WIRES SHALL MATCH THESE RATINGS.
 - REFER TO SPECIFICATIONS FOR ADDITIONAL ELECTRICAL CONDUCTOR REQUIREMENTS.

NEW WORK RISER DIAGRAM



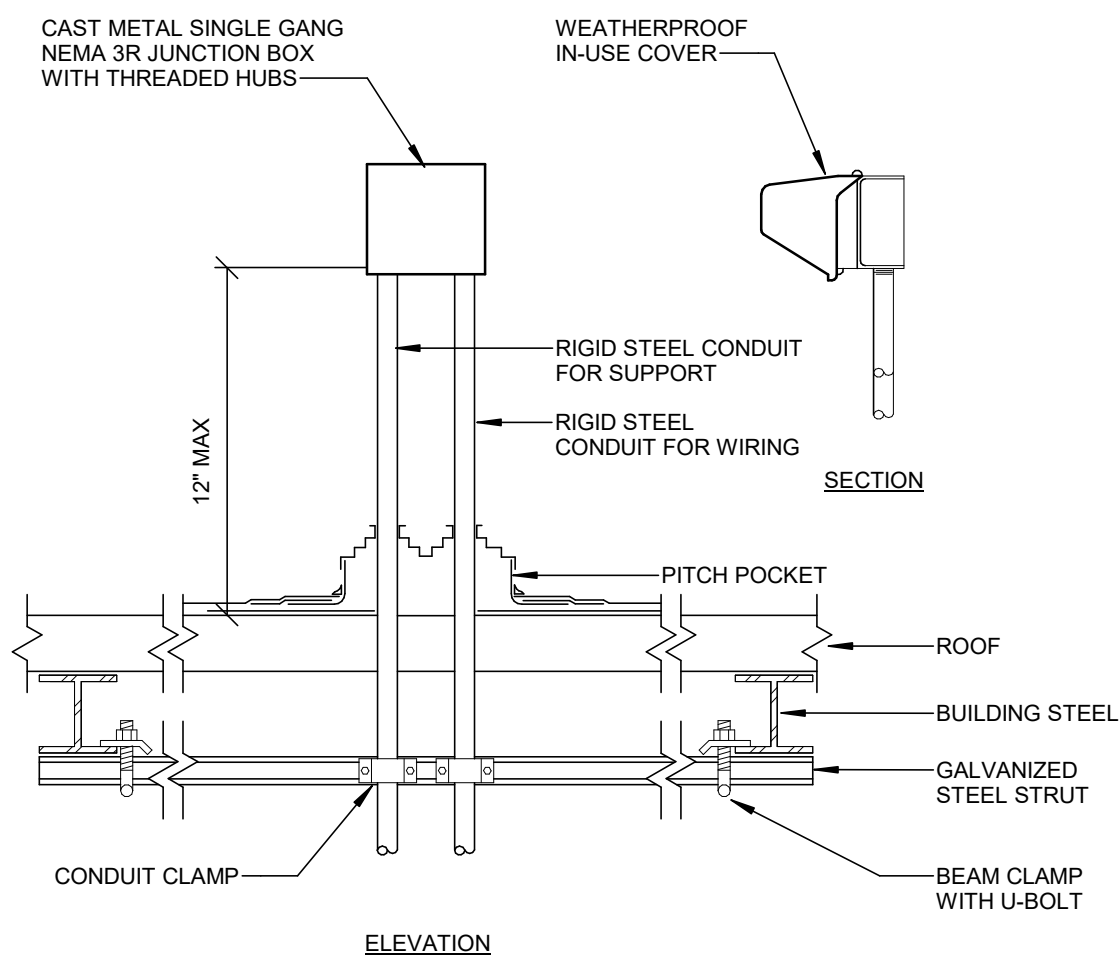
- GENERAL NOTES:
- ALL CONDUCTORS SHALL BE COPPER WITH THHN INSULATION, UNLESS OTHERWISE NOTED.
 - REFER TO PANEL SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
 - ANTICIPATED FEEDER SIZE PER THREE PHASE COPPER FEEDER SCHEDULE. CONTRACTOR TO VERIFY EXISTING WIRE SIZE IN FIELD AND REPORT TO ENGINEER IF DIFFERENT FROM ANTICIPATED SIZE.
 - TEMPORARILY DISCONNECT AND RE-FEED ALL EXISTING ACTIVE (ENERGIZED) CIRCUITS WITHIN EXISTING PANELBOARD. EXTEND TO NEW PANELBOARD AS REQUIRED. PROVIDE CIRCUIT BREAKERS IN NEW PANELBOARD THAT MATCH THE EXISTING TO BE RELOCATED CIRCUIT RATINGS. PROVIDE WIRE AND CONDUIT TO MATCH EXISTING TO BE RELOCATED CIRCUITS. ANTICIPATED CIRCUITS TO BE RELOCATED (VERIFY IN FIELD):
- (8) 20A/1P CIRCUITS
- (1) 20A/2P CIRCUIT
- (1) 20A/3P CIRCUIT
- ADDITIONAL CIRCUITS, SHOWN ON PANEL SCHEDULE FOR NEW PANEL "HVAC"
 - INTERCEPT EXISTING PANELBOARD FEEDER AND EXTEND TO NEW PANEL "HVAC". PROVIDE WIRE AND CONDUIT SIZE TO MATCH EXISTING FEEDER.
 - REFER TO PANELBOARD SCHEDULE "HVAC" FOR ADDITIONAL INFORMATION.



2 FIRE ALARM RISER - CONNECT TO EXISTING NTS

- NOTES:
- PROVIDE ADDITIONAL BATTERIES, CONTROL CARDS, EXPANSION MODULES, ETC TO ACCOMMODATE NEW DEVICES AS REQUIRED BY MANUFACTURER. NEW COMPONENTS MUST BE BY SAME MANUFACTURER AS EXISTING.
 - PROVIDE TESTING AND REPROGRAMMING OF EXISTING CONTROL PANEL TO ACCOMMODATE NEW DEVICES.
 - PROVIDE ALL NECESSARY SYNCHRONIZATION OF NEW STROBES.
 - PROVIDE WIRING OF SAME CLASS/STYLE AS EXISTING FIRE ALARM WIRING USED IN BUILDING. PROVIDE METAL-CLAD CABLING WHEN CONCEALED AND WIRE IN RACEWAY WHERE EXPOSED.
 - REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF DEVICES.

1 ELECTRICAL RISER DIAGRAM NTS



- NOTES:
- WHERE APPLICABLE MOUNT ROOF RECEPTACLE TO MECHANICAL EQUIPMENT ENCLOSURES.
 - COORDINATE WITH ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS AND SEALING TO MAINTAIN ROOF WARRANTY.

3 ROOF MOUNTED RECEPTACLE DETAIL NTS

EQUIPMENT	OCPD	PANEL	LOAD			LOCAL DISC. SW	MOTOR STARTER			WIRING	REMARKS		
			HP	MCA	KW		PH	VOLT	SIZE			TYPE	LOCATION
RTU-1	60A-3P	HVAC	-	48	-	3	208	60A-3P	-	SPC	AT UNIT	3#6, #10G, 1°C	SEE REMARK #1
RTU-2	110A-3P	HVAC	-	85	-	3	208	200A-3P	-	SPC	AT UNIT	3#2, #6G, 2°C	SEE REMARK #1

GENERAL NOTES:

- DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE AND SHALL BE LOCATED AT EQUIPMENT LOCATION UNLESS OTHERWISE NOTED.
- ABBREVIATIONS:
 - MAN: MANUAL STARTER (TOGGLE SWITCH WITH THERMAL OVERLOADS)
 - FVNR: COMBINATION FULL VOLTAGE NON-REVERSING STARTER/ DISCONNECT SWITCH
 - VFD: VARIABLE FREQUENCY DRIVE. FURNISHED BY DIV. 23. WIRE BY DIV. 26. PROVIDE POWER WIRING FROM SOURCE PANELBOARD TO VFD AND FROM VFD TO MOTOR(S). COORDINATE EXACT LOCATION IN FIELD WITH DIV. 23.
 - DIV. 21: EQUIPMENT FURNISHED BY DIVISION 21 FIRE PROTECTION CONTRACTOR
 - DIV. 22: EQUIPMENT FURNISHED BY DIVISION 22 PLUMBING CONTRACTOR
 - DIV. 23: EQUIPMENT FURNISHED BY DIVISION 23 HVAC CONTRACTOR
 - SPC: SINGLE POINT CONNECTION (STARTERS INTEGRAL TO EQUIPMENT). COORDINATE EXACT POINT OF CONNECTION IN FIELD.
- OVERCURRENT PROTECTION DEVICES (OCPD) SHALL BE MOLDED CASE CIRCUIT BREAKERS UNLESS NOTED WITH AN "F" FOR FUSE.
- DISCONNECT SWITCHES AND STARTERS SHALL BE NEMA 3R RATED WHEN LOCATED OUTSIDE.
- REFER TO PANEL SCHEDULES FOR SOURCE PANEL/CIRCUIT INFORMATION.
- REFER TO ELECTRICAL AND MECHANICAL PLANS FOR EXACT LOCATIONS OF EQUIPMENT.
- STARTERS SHALL BE SQUARE D CLASS 8536 OR APPROVED EQUAL.

REFERENCED REMARKS:

- PROVIDE WEATHERPROOF, GFCI TYPE RECEPTACLE OUTLET MOUNTED ON ROOF ADJACENT TO UNIT. REFER TO FLOOR PLANS FOR CIRCUITING AND MOUNTING DETAIL.

Branch Panel: HVAC

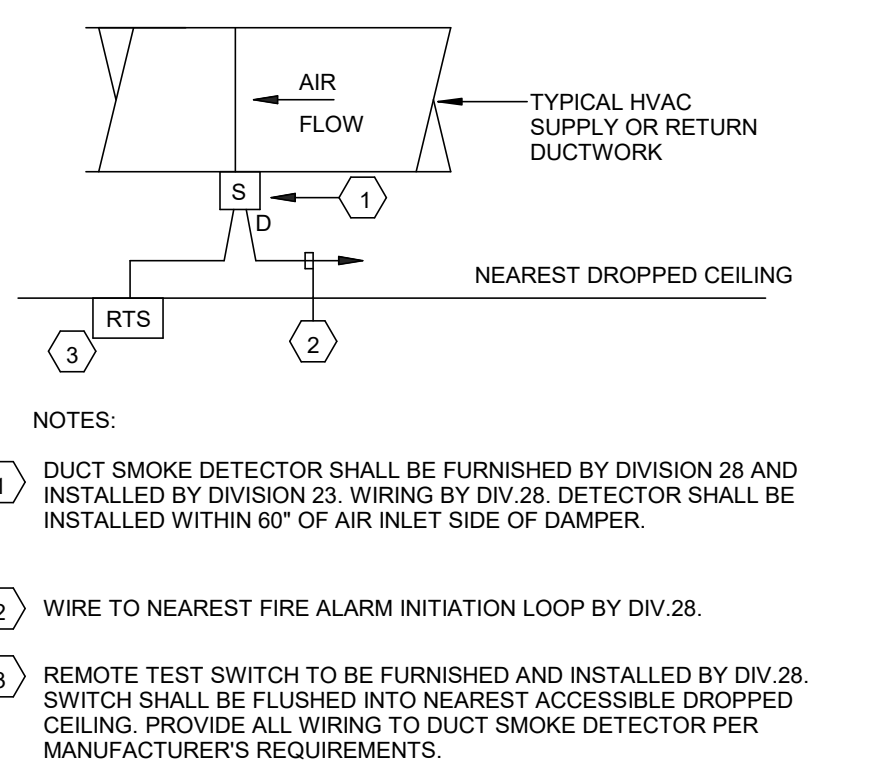
Location: Library Closet
Supply From: See Riser Diagram
Mounting: Surface
Enclosure: Type 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22,000
Bus Material: CU
Bus Rating: 400 A
MCB Rating / MLO: 400A/3P MCB

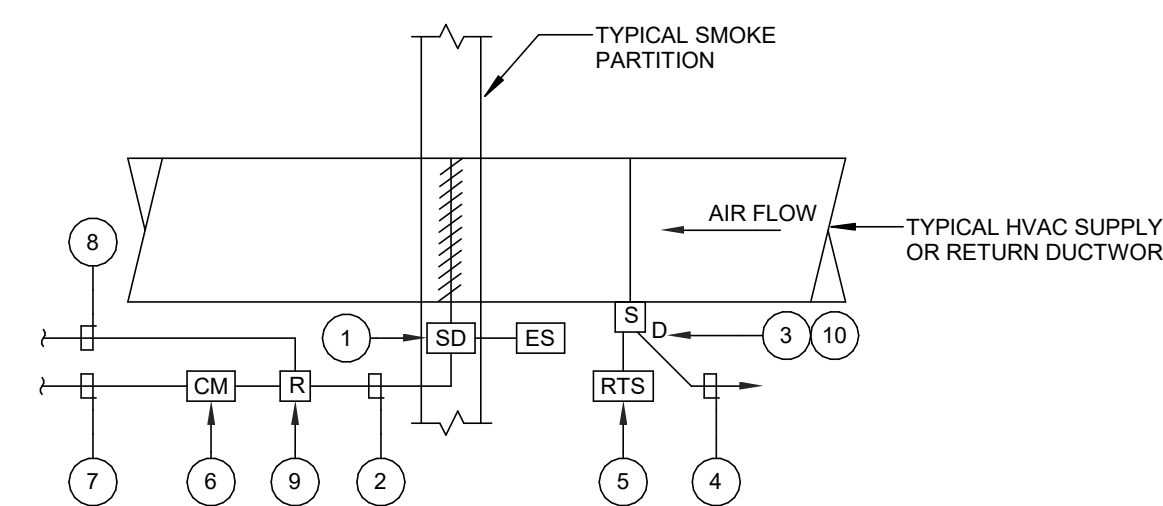
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	RTU-1	60 A	3	4.61	8.16			3	110 A RTU-2	2	
3		--	--		4.61	8.16		--		4	
5		--	--			4.61	8.16	--		6	
7	RCPT: RTU-1	20 A	1	0.18	0.18			1	20 A RCPT: RTU-2	8	
9	EXISTING PANEL "B"	200 A	3			12.00	0.50	1	20 A VAV JUNCTION BOX	10	
11		--	--			12.00	0.50	1	20 A VAV JUNCTION BOX	12	
13		--	--	12.00	0.00			1	20 A SPARE	14	
15	SPARE	20 A	1		0.00	0.00		1	20 A SPARE	16	
17	SPARE	20 A	1		0.00	0.00		1	20 A SPARE	18	
19	SPARE	20 A	1	0.00	0.00			1	20 A SPARE	20	
21	SPACE FOR RELOCATED CIRCUIT	--	--		0.00	0.00		--	SPACE FOR RELOCATED CIRCUIT	22	
23	SPACE FOR RELOCATED CIRCUIT	--	--			0.00	0.00	--	SPACE FOR RELOCATED CIRCUIT	24	
25	SPACE FOR RELOCATED CIRCUIT	--	--	0.00	0.00			--	SPACE FOR RELOCATED CIRCUIT	26	
27	SPACE FOR RELOCATED CIRCUIT	--	--		0.00	0.00		--	SPACE FOR RELOCATED CIRCUIT	28	
29	SPACE FOR RELOCATED CIRCUIT	--	--			0.00	0.00	--	SPACE FOR RELOCATED CIRCUIT	30	
31	SPACE FOR RELOCATED CIRCUIT	--	--	0.00	0.00			--	SPACE FOR RELOCATED CIRCUIT	32	
33	SPACE FOR RELOCATED CIRCUIT	--	--			0.00	0.00	--	SPACE FOR RELOCATED CIRCUIT	34	
35	SPACE FOR RELOCATED CIRCUIT	--	--			0.00	0.00	--	SPACE FOR RELOCATED CIRCUIT	36	
37	SPACE FOR RELOCATED CIRCUIT	--	--	0.00	0.00			--	SPACE FOR RELOCATED CIRCUIT	38	
39	SPACE FOR RELOCATED CIRCUIT	--	--			0.00	0.00	--	SPACE FOR RELOCATED CIRCUIT	40	
41	SPACE FOR RELOCATED CIRCUIT	--	--				0.00	0.00	SPACE FOR RELOCATED CIRCUIT	42	
Phase Load:				25.13 kVA	25.27 kVA	25.27 kVA					
Phase...				209.4 A	210.7 A	210.7 A					
Total Load:				75.66 kVA							
Total Amps:				210.02 A							

Notes:
RE-WIRE ALL ACTIVE (ENERGIZED) CIRCUITS FROM EXISTING PANELBOARD TO THIS PANELBOARD. REFER TO ELECTRICAL RISER DIAGRAM



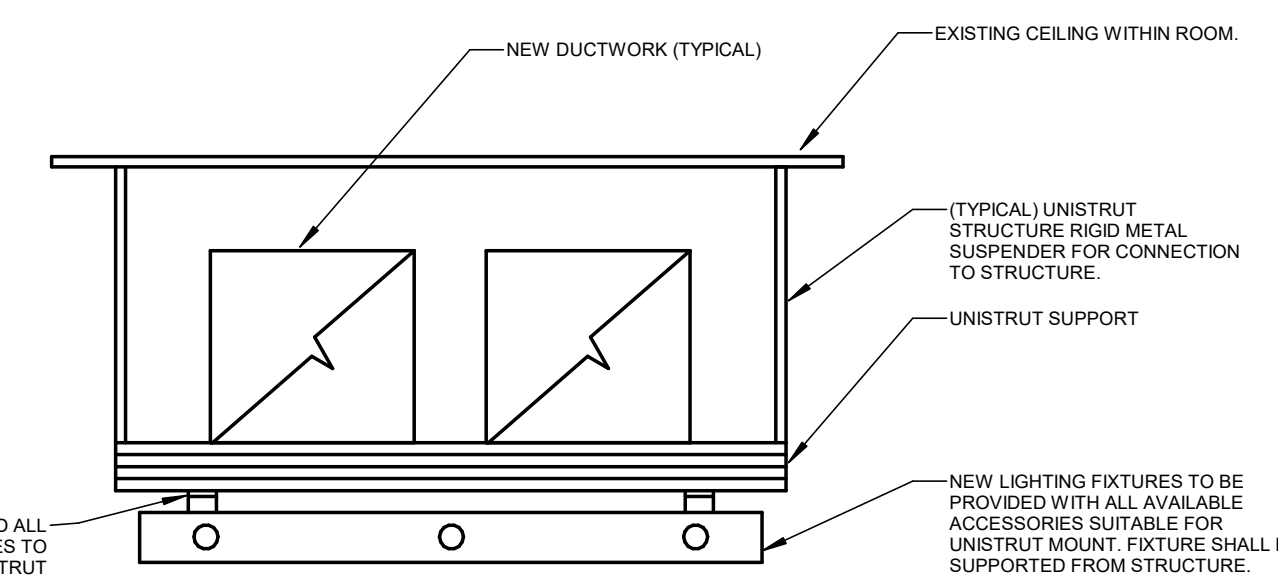
- NOTES:
- DUCT SMOKE DETECTOR SHALL BE FURNISHED BY DIVISION 28 AND INSTALLED BY DIVISION 23. WIRING BY DIV. 28. DETECTOR SHALL BE INSTALLED WITHIN 60° OF AIR INLET SIDE OF DAMPER.
 - WIRE TO NEAREST FIRE ALARM INITIATION LOOP BY DIV. 28.
 - REMOTE TEST SWITCH TO BE FURNISHED AND INSTALLED BY DIV. 28. SWITCH SHALL BE FLUSHED INTO NEAREST ACCESSIBLE DROPPED CEILING. PROVIDE ALL WIRING TO DUCT SMOKE DETECTOR PER MANUFACTURER'S REQUIREMENTS.

4 TYPICAL DUCT SMOKE DETECTOR DETAIL NTS



- NOTES:
- DUCT SMOKE DAMPER(S) AND END SWITCH(ES) SHALL BE FURNISHED BY DIV. 23. SMOKE DAMPER WIRING BY DIV. 26. END SWITCH WIRING BY DIV. 23.
 - ALL WIRING SHALL BE FURNISHED AND INSTALLED BY DIVISION 26 UNLESS OTHERWISE NOTED. ALL WIRING SHALL BE #12 THHN.
 - DUCT SMOKE DETECTOR SHALL BE FURNISHED BY DIVISION 28 AND INSTALLED BY DIVISION 23. PROVIDE SAMPLING TUBE CROSSING THE ENTIRE WIDTH OF THE DUCT.
 - FIRE ALARM ZONE WIRING PER MANUFACTURER'S REQUIREMENTS. PROVIDED BY DIVISION 28.
 - REMOTE TEST/RESET KEY SWITCH AND ASSOCIATED WIRING PROVIDED BY DIV. 28.
 - FIRE ALARM CONTROL MODULE/RELAY MODULE PROVIDED BY DIV. 28. WIRED IN SERIES WITH BMS INPUT RELAY TO CLOSE DAMPER UPON ACTIVATION.
 - DIVISION 26 SHALL PROVIDE 2#12, 1#12G, 3/4" FC FOR DAMPER POWER FROM LOCAL 120VAC OPTIONAL STANDBY SOURCE. SEE PLANS FOR ADDITIONAL INFORMATION.
 - LOW VOLTAGE COIL CONTROL WIRING FROM BUILDING MANAGEMENT SYSTEM. WIRING BY DIV. 23.
 - UL LISTED DPDT RELAY WITH LOW VOLTAGE COIL BY DIV. 26. COORDINATE COIL OPERATING VOLTAGE WITH DIV. 23.
 - LOCATE DUCT SMOKE DETECTORS WITHIN 5 FT. OF THE SMOKE DAMPER.

5 TYPICAL FIRE/SMOKE DAMPER DETAIL WITH DETECTOR NTS



6 LIGHTING FIXTURE MOUNTED TO UNISTRUT STRUCTURE SUPPORT DETAIL NTS

TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS

525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD\PRODUCTION\PROJ-21\2021248.00 - CHESHIRE HIGH SCHOOL - HVAC\ARCH\TITLE BLOCK

AUTHOR: MC/CB
DRAFTER: MC/CB
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

ELECTRICAL SCHEDULES AND DIAGRAMS

SHEET NUMBER:

E6.00

DIVISION 26 SPECIFICATIONS

SECTION 26 04 00 - GENERAL CONDITIONS FOR ELECTRICAL TRADES

A. DESCRIPTION

- 1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL MINIMIZE ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
 - 2. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN.
- B. DEFINITIONS:**
- 1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."
 - 2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
 - 3. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
 - 4. REMOVE: THE TERM REMOVE MEANS TO DISCONNECT FROM ITS PRESENT POSITION; REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
 - 5. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT.

C. EQUIPMENT EQUIVALENTS AND SUBSTITUTIONS:

- 1. CERTAIN MANUFACTURERS OF MATERIAL, APPARATUS OR APPLIANCES ARE INDICATED IN THE DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT. THESE ITEMS HAVE BEEN USED AS THE BASIS OF DESIGN, AND AS A CONVENIENCE IN FIXING THE MINIMUM STANDARD OF WORKMANSHIP, FINISH AND DESIGN THAT IS REQUIRED, THE CONTRACTOR MAY USE AN "APPROVED EQUAL" ALTERNATIVE TO THE BASIS OF DESIGN, AND IF THE FEATURES OF THAT ALTERNATIVE HAVE AN IMPACT ON OTHER COMPONENTS OF THE PROJECT, THE CONTRACTOR SHALL INCLUDE THE NECESSARY ADJUSTMENTS IN THOSE COMPONENTS, WHETHER FOR ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION, OR ANY OTHER ELEMENTS, PLUS ANY ADJUSTMENTS FOR DIFFERENCE IN PERFORMANCE.
- 2. EQUIPMENT, MATERIAL OR DEVICES SUBMITTED FOR REVIEW AS AN "EQUIVALENT" SHALL MEET THE FOLLOWING REQUIREMENTS:
 - A. THE EQUIVALENT SHALL HAVE THE SAME CONSTRUCTION FEATURES SUCH AS, BUT NOT LIMITED TO:
 - a. MATERIAL THICKNESS, GAUGE, WEIGHT, DENSITY, ETC.
 - b. WELDED, RIVETED, BOLTED, ETC., CONSTRUCTION
 - B. FINISH UNLOADING, UNPACKING, CORROSION PROTECTION
 - C. THE EQUIVALENT SHALL PERFORM WITH THE SAME OR BETTER OPERATING EFFICIENCY.
 - D. THE EQUIVALENT SHALL BE LOCALLY REPRESENTED BY THE MANUFACTURER FOR SERVICE, PARTS AND TECHNICAL INFORMATION.
 - E. THE EQUIVALENT SHALL BEAR THE SAME LABELS OF PERFORMANCE CERTIFICATION AS IS APPLICABLE TO THE SPECIFIED ITEM, SUCH AS UL OR NEMA LABELS OR DLC QUALIFICATIONS.

D. DRAWINGS:

- 1. PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.
- 2. WHERE DISCREPANCIES OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS OR WITHIN EITHER OF THE DOCUMENTS, THE ITEM OR ARRANGEMENT OF BETTER QUALITY, HIGHER RATING, OR HIGHER VALUE SHALL BE INCLUDED IN THE CONTRACT PRICE. THE OWNER AND ENGINEER SHALL DECIDE ON THE ITEM AND THE MANNER IN WHICH THE WORK SHALL BE INSTALLED.

E. SURVEY AND MEASUREMENTS:

- 1. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIABLE BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.
- 2. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ANY ADJUSTMENTS OR CHANGES ARE ALL ORDERED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN "AS NECESSARY" TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
- 4. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.

F. CODES AND STANDARDS: ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST RECENTLY ADOPTED EDITIONS OF THE FOLLOWING CODES AND STANDARDS, INCLUDING ALL JURISDICTIONAL REGULATIONS:

- 1. STATE BUILDING CODE INCLUDING ALL SUPPLEMENTS
- 2. STATE FIRE SAFETY CODE INCLUDING SUPPLEMENTS
- 3. STATE FIRE PREVENTION CODE INCLUDING ALL SUPPLEMENTS
- 4. THE INTERNATIONAL BUILDING CODE
- 5. THE INTERNATIONAL EXISTING BUILDING CODE
- 6. THE INTERNATIONAL FIRE CODE
- 7. THE INTERNATIONAL MECHANICAL CODE
- 8. THE INTERNATIONAL PLUMBING CODE
- 9. THE INTERNATIONAL ENERGY CONSERVATION CODE
- 10. NFPA 1: FIRE CODE
- 11. NFPA 70: NATIONAL ELECTRICAL CODE
- 12. NFPA 72: NATIONAL FIRE ALARM AND SIGNALING CODE
- 13. NECA 1: STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION
- 14. NETA ATS.

G. PERMITS AND FEES:

- 1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS. FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION, OBTAIN ALL REQUIRED CERTIFICATION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

H. SHOP DRAWINGS:

- 1. PROVIDE SHOP DRAWINGS FOR ALL DEVICES SPECIFIED UNDER EQUIPMENT SPECIFICATIONS FOR ALL SYSTEMS INCLUDING FIRE ALARM, SWITCHGEAR, CLOCK, LIGHTING, ETC., OR WHERE CALLED FOR ELSEWHERE IN THE SPECIFICATIONS, OR WHERE SCHEDULED ON THE DRAWINGS, OR WHERE CALLED OUT ON THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE MANUFACTURER'S NAMES, CATALOG NUMBERS, CUTS, DIAGRAMS, DIMENSIONS, IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED, COMPLIANCE WITH SPECIFIED STANDARDS, NOTATION OF COORDINATION REQUIREMENTS, NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT AND OTHER DATA AS MAY BE REQUIRED TO IDENTIFY AND ACCEPT THE EQUIPMENT. A COMPLETE LIST IN EACH CATEGORY (EXAMPLE: ALL FIXTURES) OF ALL SHOP DRAWINGS, CATALOG CUTS, MATERIAL LISTS, ETC., SHALL BE SUBMITTED TO THE ENGINEER AT ONE TIME. NO CONSIDERATION WILL BE GIVEN TO A PARTIAL SHOP DRAWING SUBMITTAL.
- 2. SHOP DRAWINGS SHALL INCLUDE EQUIPMENT SUBMITTALS, FABRICATION AND INSTALLATION DRAWINGS, SETTING DIAGRAMS, SCHEDULES, PATTERNS, TEMPLATES AND SIMILAR DRAWINGS. INCLUDE THE FOLLOWING INFORMATION:
 - A. DIMENSIONS
 - B. WIRING DIAGRAMS AND RISER DIAGRAMS
 - C. CALCULATIONS
 - D. IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED.
 - E. COMPLIANCE WITH SPECIFIED STANDARDS AND PERFORMANCE DATA AS INDICATED.
 - F. NOTATION OF COORDINATION REQUIREMENTS
 - G. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.
 - H. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
 - I. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SHOP DRAWINGS.
- 3. SHOP DRAWINGS SHALL BE IN PDF/OCR FORMAT. PHOTOCOPIES ARE NOT ACCEPTABLE.

I. COORDINATION DRAWINGS:

- 1. PREPARE COORDINATION DRAWINGS AT A SCALE TO MATCH THE CONTRACT DOCUMENT FLOOR PLANS; DETAILING MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF ELECTRICAL EQUIPMENT AND MATERIALS IN RELATIONSHIP WITH OTHER SYSTEMS, INSTALLATIONS, AND BUILDING COMPONENTS. INDICATE LOCATIONS WHERE SPACE IS LIMITED FOR INSTALLATION AND ACCESS AND WHERE SEQUENCING AND COORDINATION OF INSTALLATIONS ARE OF IMPORTANCE TO THE EFFICIENT FLOW OF THE WORK, INCLUDING (BUT NOT NECESSARILY LIMITED TO) THE FOLLOWING:
 - A. INDICATE THE PROPOSED LOCATIONS OF LIGHT FIXTURES, PANELBOARDS, CONDUITS, CABINETS, ETC.
 - B. CLEARANCES FOR INSTALLING AND MAINTAINING INSULATION
 - C. CLEARANCES FOR SERVICING AND MAINTAINING EQUIPMENT, INCLUDING NEC REQUIREMENTS AND SPACE FOR EQUIPMENT DISASSEMBLY REQUIRED FOR PERIODIC MAINTENANCE.
 - D. EQUIPMENT CONNECTIONS AND SUPPORT DETAILS.
 - E. EXTERIOR WALL AND FOUNDATION PENETRATIONS.
 - F. FIRE-RATED WALL AND FLOOR PENETRATIONS.
 - G. SIZES AND LOCATIONS OF REQUIRED CONCRETE PADS AND BASES.
- 2. INDICATE SCHEDULING, SEQUENCING, MOVEMENT, AND POSITIONING OF LARGE EQUIPMENT INTO THE BUILDING DURING CONSTRUCTION
- 3. PREPARE FLOOR PLANS, ELEVATIONS, AND DETAILS TO INDICATE PENETRATIONS IN FLOORS, WALLS, AND CEILINGS AND THEIR RELATIONSHIP TO OTHER PENETRATIONS AND INSTALLATIONS.
- 4. PREPARE REFLECTED CEILING PLANS TO COORDINATE AND INTEGRATE INSTALLATIONS, AIR OUTLETS AND INLETS, LIGHT FIXTURES, COMMUNICATION SYSTEMS COMPONENTS, SPRINKLERS, AND OTHER CEILING-MOUNTED ITEMS.

K. OPERATIONS AND MAINTENANCE MANUALS

- 1. THE CONTRACTOR SHALL PREPARE (1) PDF COPY AND (3) HARD COPIES OF A COMPLETE MAINTENANCE AND OPERATING INSTRUCTIONS MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. FOR WIRING SYSTEMS, INCLUDE DATA IN INDIVIDUAL HEAVY-DUTY, 3-RING, VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
- 2. IDENTIFICATION:
 - A. DESCRIPTION OF FUNCTION, NORMAL OPERATING CHARACTERISTICS AND LIMITATIONS, PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, AND COMPLETE PARTS AND ACCESSORIES LIST.
 - B. MANUFACTURER'S PRINTED OPERATING PROCEDURES TO INCLUDE START-UP, BREAK-IN, AND ROUTINE AND NORMAL OPERATING INSTRUCTIONS; REGULATION, CONTROL, STOPPING, SHUT-DOWN, AND EMERGENCY INSTRUCTIONS; AND SUMMER AND WINTER OPERATING INSTRUCTIONS.
 - C. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING; DISASSEMBLY, REPAIR, AND REASSEMBLY; ALIGNING AND ADJUSTING; AND PARTS AND ACCESSORIES LIST.
 - D. SERVICING INSTRUCTIONS AND LUBRICATION CHARTS AND SCHEDULES.
 - E. EMERGENCY INSTRUCTIONS.
 - F. SPARE PARTS LIST.
 - G. COPIES OF WARRANTIES.
 - H. WIRING DIAGRAMS.
 - I. RECOMMENDED "TURN AROUND" CYCLES.
 - J. INSPECTION PROCEDURES.
 - K. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
 - L. EQUIPMENT START-UP REPORTS.

L. AS-BUILT DRAWINGS:

- 1. PREPARE AS-BUILT DRAWINGS TO A SCALE TO MATCH THE CONTRACT DOCUMENT FLOOR PLANS; DETAILING THE ACTUAL INSTALLATION OF MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF MECHANICAL EQUIPMENT AND MATERIALS. WHERE SHOP DRAWINGS ARE USED, MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.
- 2. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE.
- 3. FINAL RECORD DOCUMENTS SHALL BE PREPARED IN THE LATEST AUTOCAD VERSION AND DIGITAL MEDIA OR AS BOUND DRAWINGS AND A CLEAN SET OF REPRODUCIBLE PAPER COPIES SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE WORK.

M. WARRANTIES

- 1. ALL EQUIPMENT PROVIDED IN THIS PROJECT SHALL CARRY A MANUFACTURER'S WARRANTY FOR NO LESS THAN ONE (1) YEAR FROM DATE OF BENEFICIAL USE - UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.

N. MISCELLANEOUS REQUIREMENTS:

- 1. THE CONTRACTOR SHALL COORDINATE ALL INTERRUPTIONS OF SERVICES AND LIMITATIONS OF ACCESS WITH THE OWNER NO LESS THAN (5) DAYS PRIOR TO THE INTERRUPTION.
- 2. OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.
- 3. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF BENEFICIAL USE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD. PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE OR WARRANTY PRICE.
- 4. SUBMIT TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.

O. ELECTRICAL ACCEPTANCE TESTING

- 1. TESTING SHALL BE PERFORMED ON ELECTRICAL EQUIPMENT AND SYSTEMS TO ASSURE THE EQUIPMENT AND SYSTEMS ARE OPERATIONAL AND WITHIN APPLICABLE STANDARDS AND MANUFACTURING TOLERANCES. TESTING SHOULD VERIFY THAT EQUIPMENT AND SYSTEMS ARE INSTALLED IN ACCORDANCE WITH DESIGN SPECIFICATIONS. ALL TESTING SHALL OCCUR AT THE BUILDING SITE.
- 2. QUALIFIED TECHNICIANS WHO ARE TRAINED AND REGULARLY EMPLOYED FOR TESTING SERVICES SHALL DO ALL THE TESTING.
- 3. THE TESTING ORGANIZATION SHALL CONFORM TO THE GENERAL GUIDELINES OF SECTION 5 OF THE LATEST NETA ACCEPTANCE TESTING SPECIFICATIONS. THIS INCLUDES THE FOLLOWING:
 - A. SAFETY AND PRECAUTIONS
 - B. SUITABILITY OF TEST EQUIPMENT
 - C. TEST INSTRUMENT CALIBRATION
 - D. TEST REPORTS
- 4. NOTIFY THE ARCHITECT, ENGINEER AND OWNER AT LEAST SEVEN (7) DAYS IN ADVANCE OF ANY TESTING.

SECTION 26 05 19 - ELECTRICAL POWER CONDUCTORS AND CABLES

A. COORDINATION:

- A. COORDINATE SIZES OF RACEWAYS, BOXES, AND EQUIPMENT ENCLOSURES INSTALLED UNDER OTHER SECTIONS WITH THE ACTUAL CONDUCTORS TO BE INSTALLED, INCLUDING THE MINIMUM SIZE OF CONDUIT OR RACEWAY TO BE INSTALLED.
- B. COORDINATE WITH ELECTRICAL EQUIPMENT INSTALLED UNDER OTHER SECTIONS TO PROVIDE TERMINATIONS SUITABLE FOR USE WITH THE CONDUCTORS TO BE INSTALLED.
- C. PROVIDE SINGLE CONDUCTOR BUILDING WIRE: INSTALLED IN SUITABLE RACEWAY UNLESS OTHERWISE INDICATED, PERMITTED OR REQUIRED.
- D. CONDUCTOR SIZES AND AMPACITIES SHOWN ARE BASED ON COPPER.
- E. MINIMUM CONDUCTOR SIZES:
 - A. BRANCH CIRCUITS: 12 AWG
 - a. 20A, 120V CIRCUITS LONGER THAN 75 FEET - 10 AWG MINIMUM AND SIZED FOR VOLTAGE DROP.
 - b. 20A, 120V CIRCUITS LONGER THAN 150 FEET - 8 AWG AND SIZED FOR VOLTAGE DROP.
 - B. CONTROL CIRCUITS: 14 AWG.

- F. CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER SHALL BE SOLID ANNEALED COPPER. EXCEPT THAT CONDUCTORS FOR REMOTE CONTROL, ALARM, AND SIGNALING CIRCUITS, CLASSES 1, 2, AND 3, SHALL BE STRANDED UNLESS SPECIFICALLY INDICATED OTHERWISE.
- G. CONDUCTORS NO. 8 AWG AND LARGER DIAMETER SHALL BE STRANDED ANNEALED COPPER. UNLESS SPECIFIED OR INDICATED OTHERWISE OR REQUIRED BY NFPA 70, POWER AND LIGHTING WIRES SHALL BE 600-VOLT, TYPE THW, THHN, OR THW WITH ANNEALED COPPER. CONTROL AND SIGNAL CIRCUITS SHALL BE TYPE TW, THW, OR TF ANNEALED COPPER. UNDERGROUND CONDUCTORS SHALL BE TYPE XHHW-2.
- H. WHERE LIGHTING FIXTURES REQUIRE 90 DEGREE C CONDUCTORS, PROVIDE ONLY CONDUCTORS WITH 90 DEGREE C INSULATION OR BETTER.

- I. MAKE ALL SPLICES IN ACCESSIBLE LOCATIONS. MAKE SPLICES IN CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER WITH INSULATED, SPRING WIRE CONNECTORS WITH PLASTIC CAPS. MAKE SPLICES IN CONDUCTORS NO. 8 AWG AND LARGER DIAMETER WITH SOLDERLESS PRESSURE CONNECTORS WITH INSULATING COVERS. MAKE SPLICES IN CONDUCTORS NO. 6 AND LARGER WITH PRESSURE CONNECTORS OR SPLIT BOLT CONNECTORS.
- J. MAKE WIRE TERMINATIONS USING CRIMPED TERMINALS FOR CONDUCTORS NO. 10 AND SMALLER. MAKE WIRE TERMINATIONS FOR CONDUCTORS NO. 8 AND LARGER USING MECHANICAL OR PRESSURE CONNECTORS. PROVIDE SUITABLE REDUCERS WHERE OVERSIZED CONDUCTORS ARE LARGER THAN THE EQUIPMENT TERMINATION.

- K. PHASE CONDUCTORS SHALL BE IDENTIFIED BY COLOR CODING. THE COLOR OF THE INSULATION ON PHASES A, B, AND C RESPECTIVELY (FOR THREE PHASE) OR PHASES A AND B RESPECTIVELY (FOR SINGLE PHASE) OF DIFFERENT VOLTAGE SYSTEMS SHALL BE AS FOLLOWS:
 - A. 120/208 VOLT, THREE PHASE: BLACK, RED, AND BLUE.
 - B. 120/240 VOLT, SINGLE PHASE: BLACK AND RED.

- L. UNLESS OTHERWISE INDICATED, THE WIRING METHOD SHALL CONSIST OF THE INSTALLATION OF INSULATED CONDUCTORS INSTALLED IN ELECTRICAL METALLIC AND/OR WIREMOLD RACEWAY.
- M. METALLIC-ARMORED TYPE MC CABLES, WHERE ALLOWED, SHALL SHALL INCLUDE 600V INSULATION RATING, TYPE THHN/THWN-2 COPPER CONDUCTORS, DEDICATED NEUTRAL CONDUCTOR AND STEEL OVERLAPPING ARMOR. USE PERMITTED:
 - A. WHERE CONCEALED ABOVE ACCESSIBLE CEILINGS FOR FINAL CONNECTIONS TO LUMINAIRES (MAXIMUM LENGTH 6 FEET).
 - B. WHERE CONCEALED IN HOLLOW STUD WALLS, ABOVE ACCESSIBLE CEILINGS, AND UNDER RAISED FLOOR FOR BRANCH CIRCUITS UP TO 20A.

- C. EXCEPTION: PROVIDE SINGLE CONDUCTOR BUILDING WIRING IN RACEWAY FOR CIRCUIT HOMERUN FROM FIRST DEVICE IN SPACE TO PANELBOARD.
- N. PROVIDE INSULATED, GREEN EQUIPMENT GROUNDING CONDUCTOR IN FEEDER AND BRANCH CIRCUITS, INSTALLED IN CONDUIT OR RACEWAYS, INCLUDING LIGHTING CIRCUITS. GROUNDING CONDUCTOR SHALL BE SEPARATE FROM ELECTRICAL SYSTEM NEUTRAL CONDUCTOR.

SECTION 26 05 26 - GROUNDING AND BONDING

- A. GROUNDING SHALL BE COMPLETED IN ACCORDANCE WITH NFPA 70, GROUND EXPOSED, NON-CURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN METALLIC AND NONMETALLIC RACEWAYS, AND NEUTRAL CONDUCTOR OF WIRING SYSTEMS, WHERE GROUND FAULT PROTECTION IS PROVIDED, ENSURE THAT CONNECTION OF GROUND AND NEUTRAL DOES NOT INTERFERE WITH CORRECT OPERATION OF FAULT PROTECTION.
- B. EXISTING WORK: WHERE EXISTING GROUNDING AND BONDING SYSTEM COMPONENTS ARE INDICATED TO BE REUSED, THEY MAY BE REUSED ONLY WHERE THEY ARE FREE FROM CORROSION, INTEGRITY AND CONTINUITY ARE VERIFIED, AND WHERE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- C. WHERE CONDUCTOR SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NFPA 70.
- D. USE INSULATED COPPER CONDUCTORS UNLESS OTHERWISE INDICATED. USE BARE COPPER CONDUCTORS WHERE INSTALLED UNDERGROUND OR ENCASED IN CONCRETE.
- E. USE LISTED MECHANICAL CONNECTORS, COMPRESSION CONNECTORS OR THERMIC WELDED CONNECTIONS FOR ACCESSIBLE CONNECTIONS. USE EXOTHERMIC WELDED CONNECTIONS FOR UNDERGROUND, CONCEALED OR OTHERWISE INACCESSIBLE CONNECTIONS.
- F. GROUNDING ELECTRODE SYSTEM: PROVIDE CONNECTION TO REQUIRED AND SUPPLEMENTAL GROUNDING ELECTRODES INDICATED TO FORM GROUNDING ELECTRODE SYSTEM. PROVIDE CONTINUOUS GROUNDING ELECTRODE CONDUCTORS WITHOUT SPLICE OR JOINT. INSTALL GROUNDING ELECTRODE CONDUCTORS IN RACEWAY WHERE EXPOSED OR PROTECTED FOR PHYSICAL DAMAGE. BOND GROUNDING ELECTRODE CONDUCTOR TO METALLIC RACEWAY AT EACH END WITH BONDING JUMPER.

SECTION 26 05 29 - HANGERS AND SUPPORTS

- A. PROVIDE ALL REQUIRED HANGERS, SUPPORTS, ANCHORS, FASTENERS, FITTINGS, ACCESSORIES AND HARDWARE NECESSARY FOR THE COMPLETE INSTALLATION OF THE ELECTRICAL WORK.
- B. HANGERS AND SUPPORTS SHALL MEET ASTM STANDARDS FOR COATINGS, NECA 1 STANDARDS FOR WIRING SYSTEMS, AND UL 58 FOR FRUIT-TYPE CHANNEL RACEWAY AND FITTINGS.
- C. WHERE SUPPORT AND ATTACHMENT COMPONENT TYPES AND SIZES ARE NOT INDICATED, SELECT IN ACCORDANCE WITH MANUFACTURER'S APPLICATION CRITERIA AS REQUIRED FOR THE INTENDED USE. THE FOLLOWING SHALL APPLY:
 - D. STEEL COMPONENTS: USE CORROSION RESISTANT MATERIALS SUITABLE FOR THE ENVIRONMENT WHERE INSTALLED. USE ZINC-PLATED STEEL FOR INDOOR DRY LOCATIONS. USE GALVANIZED STEEL, STAINLESS STEEL, FIBERGLASS OR APPROVED EQUIVALENT FOR OUTDOOR, DAMP AND WET LOCATION INSTALLATIONS.
 - E. CONDUIT AND CABLE SUPPORTS:
 - A. CONDUIT STRAPS: ONE-HOLE OR TWO-HOLE, ZINC PLATED.
 - B. CONDUIT CLAMPS: BOLTED TYPE.
 - F. OUTLET BOX SUPPORTS: HANGERS AND BRACKETS SUITABLE FOR BOXES TO BE SUPPORTED.
 - G. METAL CHANNEL (STRUT) FRAMING SYSTEMS: FACTORY FABRICATED CONTINUOUS SLOTTED METAL CHANNELS WITH ASSOCIATED FITTINGS, ACCESSORIES, AND HARDWARE FOR FIELD ASSEMBLY OF SUPPORTS, ALL LOCATIONS. USE 12 GA. GALVANIZED STEEL.
 - H. HANGER RODS: CONTINUOUS THREADING, ZINC-PLATED STEEL.
 - I. USE OF POWER-ACTUATED FASTENERS REQUIRES APPROVAL OF ARCHITECT AND STRUCTURAL ENGINEER.
 - J. UNLESS SPECIFICALLY INDICATED, DO NOT SUPPORT ANY ELECTRICAL COMPONENT FROM THE ROOF DECK.
 - K. PLASTIC AND LEAD ANCHORS ARE NOT PERMITTED.

SECTION 26 05 33 - RACEWAY AND BOXES

- A. PROVIDE A COMPLETE WIRING SYSTEM OF RACEWAYS AND BOXES LOCATED AS INDICATED ON DRAWINGS AND AT LOCATIONS AS REQUIRED FOR SPLICES, TAPS, WIRE PULLING, EQUIPMENT CONNECTIONS AND COMPLIANCE WITH REGULATORY REQUIREMENTS. LOCATIONS INDICATED ON DRAWINGS ARE APPROXIMATE UNLESS DIMENSIONED.
- B. STANDARDS: MATERIALS SHALL COMPLY WITH ANSI C80, (X), NEMA AND UL REQUIREMENTS AS APPLICABLE FOR TYPE AND MATERIAL.
- C. MINIMUM CONDUIT SIZE, UNLESS OTHERWISE NOTED: INTERIOR - 3/4", EXTERIOR EXPOSED 3/4" CONDUIT APPLICATIONS.
 - A. CONCEALED IN MASONRY WALLS: USE EMT WITH FLUSH MOUNTED MASONRY BOXES.
 - B. CONCEALED IN HOLLOW STUD WALLS: USE RIGID CONDUIT OR MC CABLE (WHERE ALLOWED). PROVIDE FLUSH SHEET-METAL BOXES.
 - C. INTERIOR DAMP OR WET LOCATIONS: USE RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT, OR MC CABLE. DAMP, WET OR CORROSIVE LOCATIONS: USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT, MAXIMUM LENGTH 6 FEET.
 - D. EXPOSED, INTERIOR DRY LOCATIONS: USE EMT CONDUIT.
 - E. EXPOSED FINISHED LOCATIONS: PROVIDE SCHEDULE METAL RACEWAY AND FITTINGS. UNLESS SPECIFIED ON DRAWINGS, REQUIRES DESIGN TEAM APPROVAL. COORDINATE ALL VERTICAL RUNS OF SURFACE RACEWAY WITH ARCHITECT PRIOR TO INSTALLATION.
 - F. CONCEALED IN MASONRY WALLS: ACCESSIBLE CEILINGS: USE FLEXIBLE METAL CONDUIT, MAXIMUM LENGTH OF 6 FEET.
 - G. CONNECTIONS TO VIBRATING EQUIPMENT: DRY LOCATIONS - USE FLEXIBLE METAL CONDUIT OR MC CABLE; DAMP, WET OR CORROSIVE LOCATIONS - USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT, MAXIMUM LENGTH 6 FEET.
- E. FITTINGS:
 - A. EMT - COMPLY WITH NEMA FB 1 AND UL 514B. STEEL WITH COMPRESSION FITTINGS IN DAMP OR WET LOCATIONS. SET SCREW TYPE ELSEWHERE.
 - B. RIGID METAL CONDUIT - COMPLY WITH ANSI C80.1 AND UL 6. THREADED STEEL OR MALLEABLE IRON. USE FITTING LISTED AND LABELED AS COMPLYING WITH UL 514B IN HAZARDOUS LOCATIONS.
 - C. FLEXIBLE METAL CONDUIT - COMPLY WITH NEMA FB 1 AND UL 514B. USE STEEL FITTINGS.
 - D. LIQUIDTIGHT FLEXIBLE METAL CONDUIT - COMPLY WITH NEMA FB 1 AND UL 514B. USE STEEL CITY REE.
 - E. SURFACE METAL RACEWAY - PROVIDE FITTINGS FROM SAME MANUFACTURER AS SURFACE RACEWAY. INCLUDE ALL REQUIRED ELBOWS, COUPLINGS MOUNTING CLIPS, COVERS, END FITTINGS AND DEVICE MOUNTING BRACKETS.
 - F. BOXES: WHERE A BOX SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NFPA 70, BUT NOT LESS THAN APPLICABLE MINIMUM SIZE SPECIFIED.
 - A. USE SHEET METAL STEEL BOXES IN DRY LOCATIONS.
 - B. USE MALLEABLE IRON OR CAST ALUMINUM BOXES WITH THREADED HUBS WHERE EXPOSED RIGID METAL CONDUIT IS USED.
 - C. USE NONMETALLIC BOXES WHERE EXPOSED RIGID PVC CONDUIT IS USED.
 - D. USE SUITABLE CONCRETE TYPE BOXES WHERE FLUSH MOUNTED IN CONCRETE.
 - E. USE SUITABLE MASONRY TYPE BOXES WHERE FLUSH MOUNTED IN MASONRY WALLS.
 - F. USE RAISED COVERS SUITABLE FOR TYPE OF WALL CONSTRUCTION AND DEVICE CONFIGURATION WHERE APPLICABLE.
 - G. USE MULTI-GANG BOXES OF SINGLE-Piece CONSTRUCTION. DO NOT USE FIELD CONNECTED GANGABLE BOXES.
 - H. MINIMUM BOX SIZE: UNLESS OTHERWISE INDICATED: WIRING DEVICE - 4 INCH SQUARE BY 2-1/2" DEEP. COMMUNICATIONS SYSTEM OUTLET 4 INCH SQUARE BY 2-1/2" DEEP.
 - I. G. CABINETS AND ENCLOSURES: COMPLY WITH NEMA 250, UL 50 AND UL 50E OR UL 508A.
 - A. USE NEMA TYPE 1, PAINTED STEEL FOR INDOOR, DRY LOCATIONS.
 - B. USE NEMA TYPE 3R, PAINTED STEEL FOR OUTDOOR AND WET LOCATIONS.
 - C. PROVIDE SCREW COVER ENCLOSURES FOR PULL AND JUNCTION BOXES.
 - D. PROVIDE LOCKABLE, HINGE COVER TYPE FOR EQUIPMENT ENCLOSURES.
 - H. MECHANICAL SLEEVE SEALS: MODULAR MECHANICAL TYPE, WITH INTERLOCKING RUBBER LINKS SHAPED TO CONTINUOUSLY PULL ANULAR SPACE BETWEEN OBJECTS AND SLEEVE, CONNECTED WITH BOLTS AND PRESSURE PLATES TO PROVIDE A WATERTIGHT SEAL AND ELECTRICAL INSULATION.
 - I. REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT RACEWAY FLUSH WITH WALLS AND FLOORS, PATCH SURFACES TO MATCH ADJACENT SURFACES.
 - J. DISCONNECT AND REMOVE ABANDONED OUTLETS AND DEVICES.
 - K. INSTALL BLANK PLATES ON ABANDONED, EMPTY BOXES.
 - L. EXTEND EXISTING RACEWAY AND BOX INSTALLATION USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATION OR AS SPECIFIED.

SECTION 26 20 00 - ELECTRICAL DISTRIBUTION

- A. GENERAL REQUIREMENTS FOR EQUIPMENT UNDER THIS SECTION
- 1. MANUFACTURERS:
 - A. SQUARE D
 - B. SIEMENS
 - C. EATON
 - D. ABB
- 2. ENCLOSURE (UNLESS OTHERWISE INDICATED ON PLANS OR SCHEDULES):
 - A. TYPE 1 (INDOOR, DRY LOCATIONS).
 - B. TYPE 3R (OUTDOOR, WET LOCATIONS).
- B. DISCONNECT SWITCHES
 - 1. PRODUCT DESCRIPTION: HEAVY-DUTY, NEMA KS 1, ENCLOSED LOAD INTERRUPTER KNIFE SWITCH, HANDLE LOCKABLE IN "OFF" POSITION.
 - 2. ENCLOSURE: NEMA KS 1, TO MEET CONDITIONS, FABRICATE ENCLOSURE FROM STEEL FINISHED WITH MANUFACTURER'S STANDARD GRAY.
 - 3. PROVIDE WITH (2) SETS OF AUXILIARY CONTACTS.
 - 4. FURNISH SWITCHES WITH ENTIRELY COPPER CURRENT CARRYING PARTS.
 - 5. SWITCH VOLTAGE, PHASE AND AMPERAGE RATINGS AS INDICATED ON DRAWINGS.
 - 6. WHERE SPECIFIED AS FUSED DISCONNECT SWITCHES, PROVIDE WITH DUAL-ELEMENT, TIME DELAY, CLASS RK1 FUSES. FUSE RATINGS AND QUANTITIES AS INDICATED ON DRAWINGS. FUSES SHALL BE MANUFACTURED BY BUSSMAN, GOLD SHAWMUT OR LITTELFUSE. FURNISH (3) SPARE FUSES OF EACH TYPE.
- C. PANELBOARD - DISCONNECT SWITCH INSTALLATION STANDARDS
 - 1. MOUNT PANELBOARDS, CIRCUIT BREAKERS (INCLUDING PROVISIONS FOR FUTURE BREAKERS), AND DISCONNECTING SWITCHES SO HEIGHT OF OPERATING HANDLE AT ITS HIGHEST POSITION IS MAXIMUM 78 INCHES ABOVE FLOOR.
 - 2. ARRANGE EQUIPMENT TO PROVIDE MINIMUM CLEARANCES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND NFPA 70.
 - 3. INSTALL PANELBOARDS PLUMB. INSTALL FLUSH-MOUNTED PANELBOARDS SO THAT TRIMS FIT COMPLETELY FLUSH TO WALL WITH NO GAPS AND ROUGH OPENING COMPLETELY COVERED.
 - 4. INSTALL A PERMANENT LABEL INDICATING THE PANELBOARD OR TRANSFORMER WHERE THE POWER SUPPLY TO THE DEVICE ORIGINATES.
 - 5. PROVIDE FILLER PLATES TO COVER UNUSED SPACES IN PANELBOARDS.
 - 6. PROVIDE CIRCUIT BREAKER LOCK-ON DEVICES TO PREVENT UNAUTHORIZED PERSONNEL FROM DE-ENERGIZING ESSENTIAL LOADS AS INDICATED.
 - 7. PROVIDE WITH MANUFACTURER'S STANDARD ARC-FLASH LABEL.
 - D. NEW CIRCUIT BREAKERS IN EXISTING PANELBOARDS SHALL MATCH EXISTING STYLE AND SHORT CIRCUIT/IC RATING.

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

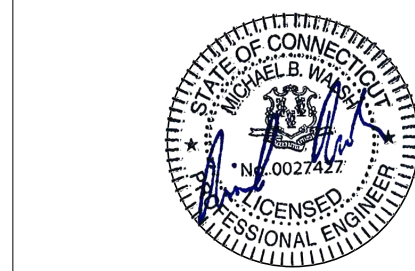
- A. EXISTING WORK: UNLESS SPECIFICALLY EXCLUDED, IDENTIFY EXISTING ELEMENTS TO REMAIN THAT ARE NOT ALREADY IDENTIFIED IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS.
- B. EMERGENCY SYSTEM EQUIPMENT: USE IDENTIFICATION NAMEPLATE OR VOLTAGE MARKER TO IDENTIFY EMERGENCY EQUIPMENT IN ACCORDANCE WITH NFPA 70. USE IDENTIFICATION NAMEPLATE AT EACH PIECE OF SERVICE EQUIPMENT TO IDENTIFY TYPE AND LOCATION OF ON-SITE EMERGENCY POWER SOURCES.
- C. USE IDENTIFICATION NAMEPLATES TO IDENTIFY EACH PIECE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT AND ASSOCIATED SECTIONS, COMPARTMENTS AND COMPONENTS. IDENTIFY: NAME, AMPERE RATING, LOADS SERVED (DISCONNECT SWITCHES, ENCLOSED TRANSFORMERS, AND TRANSFORMERS ONLY), VOLTAGE AND PHASE, AND POWER SOURCE/CIRCUIT NUMBER. INCLUDE LOCATION OF SOURCE/LOAD SERVED IF NOT WITHIN SIGHT OF EQUIPMENT.
- D. PROVIDE LAMINATED ACRYLIC OR NON-CONDUCTIVE PHENOLIC WITH BEVELED EDGES. NAMEPLATES FOR EACH EQUIPMENT ENCLOSURE, RELAY, SWITCH, AND DEVICE, NAMEPLATES SHALL BE 1/8" THICK, WHITE WITH BLACK CENTER CORE, MATTE FINISH SURFACE, BEVELED EDGES, SQUARE CORNERS, ACCURATELY ALIGNED LETTERING AND ENGRAVED INTO THE CORE. MINIMUM SIZE OF NAMEPLATE SHALL BE 1/2" BY 1/2". LETTERING SHALL BE A MINIMUM OF 1/4" HIGH NORMAL BLOCK STYLE.
- E. PROVIDE WIRE AND CABLE MARKERS OR IDENTIFICATION LABELS TO IDENTIFY CIRCUIT NUMBER AT EACH SOURCE LOCATION, WITHIN BOXES WHERE MORE THAN ONE CIRCUIT IS PRESENT, WITHIN EQUIPMENT ENCLOSURES WHERE CONDUCTORS ENTER AND EXIT THE ENCLOSURE, AND IN CABLE TRAYS (MAXIMUM 20 FT. INTERVALS). PROVIDE WRAP-AROUND SELF-ADHESIVE VINYL CLOTH, WRAP-AROUND SELF-ADHESIVE VINYL SELF-LAMINATING, HEAT-SHRINK SLEEVE, PLASTIC SLEEVE, PLASTIC CLIP-ON, OR VINYL SPLIT SLEEVE TYPE MARKERS SUITABLE FOR THE CONDUCTOR OR CABLE TO BE IDENTIFIED.
- F. PROVIDE VOLTAGE MARKERS TO IDENTIFY HIGHEST VOLTAGE PRESENT FOR ACCESSIBLE CONDUITS (MAXIMUM 20 FT. INTERVALS).
- G. PROVIDE PRE-LABELED, SNAP AROUND PIPE MARKERS ON ALL CONDUITS. MARKERS SHALL COMPLY WITH ANSI A 13.1-1988 STANDARDS AND INDICATED VOLTAGE.
- H. WIRING LABELS: USE FACTORY PRE-PRINTED OR MACHINE-RUN SELF-ADHESIVE POLYESTER OR SELF-ADHESIVE VINYL LABELS; UV, CHEMICAL, WATER, HEAT AND ABRASION RESISTANT.
- I. CLEAN SURFACES TO RECEIVE ADHESIVE PRODUCTS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- J. INSTALL IDENTIFICATION PRODUCTS TO BE PLAINLY VISIBLE FOR EXAMINATION, ADJUSTMENT, SERVICING AND MAINTENANCE.
- K. INSTALL IDENTIFICATION PRODUCTS CENTERED, LEVEL AND PARALLEL WITH LINES OF ITEM BEING IDENTIFIED.

SECTION 26 27 26 - WIRING DEVICES

- A. RECEPTACLES:
 - A. SELF-GROUNDING COMPLYING WITH NEMA WD 1 AND NEMA WD 6 AND LISTED COMPLYING WITH UL 498.
 - B. SINGLE AND DUPLEX RECEPTACLES SHALL BE RATED 20 AMPERES, 125 VOLTS, TWO-POLE, THREE-WIRE, GROUNDING TYPE WITH POLARIZED PARALLEL SLOTS.
 - C. COLOR OF BODIES SHALL BE SELECTED BY THE ARCHITECT.
 - D. RECEPTACLE SHALL BE SIDE-WIRED OR BACK-WIRED WITH TWO SCREWS PER TERMINAL.
 - E. THE THIRD GROUNDING POLE SHALL BE CONNECTED TO THE METAL MOUNTING YOKE.
 - F. RECEPTACLES WITH GROUND FAULT CIRCUIT INTERRUPTERS SHALL HAVE THE CURRENT RATING AS INDICATED, AND SHALL BE UL 943, CLASS A TYPE UNLESS OTHERWISE NOTED.
 - G. GROUND FAULT CIRCUIT PROTECTION SHALL BE PROVIDED AS REQUIRED BY NFPA 70 OR AS INDICATED ON THE DRAWINGS.
 - H. GROUND DEVICES: REFER TO DRAWINGS FOR NEMA LOCKING CONFIGURATIONS.
 - I. MOUNT RECEPTACLES AND DATA OUTLETS 18" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED, AND OTHER DEVICES AS INDICATED. MEASURE MOUNTING HEIGHTS OF WIRING DEVICES AND OUTLETS TO TOP OF DEVICE OR OUTLET.
 - J. PROVIDE TAMPER RESISTANT RECEPTACLES WHERE INDICATED ON DRAWINGS.

SECTION 26 50 00 - LIGHTING FIXTURES

- A. LUMINAIRE TYPES
- 1. FURNISH PRODUCTS AS INDICATED IN LIGHTING FIXTURE SCHEDULE INCLUDED ON THE DRAWINGS. REFER TO NOTES ON LIGHTING FIXTURE SCHEDULE FOR SUBSTITUTION LIMITATIONS.
- B. INTERIOR LUMINAIRES
 - 1. MANUFACTURERS:
 - A. MANUFACTURERS REPRESENTED BY LIGHTING AFFILIATES.
 - B. MANUFACTURERS REPRESENTED BY ILLUMINATE LIGHTING.
 - C. MANUFACTURERS REPRESENTED BY APEX LIGHTING.
 - 2. PROVIDE PRODUCTS THAT COMPLY WITH REGULATORY REQUIREMENTS OF NFPA 70.
 - 3. PROVIDE PRODUCTS THAT ARE LISTED AND LABELED AS COMPLYING WITH UL 1598, WHERE APPLICABLE.
 - 4. UNLESS OTHERWISE INDICATED, PROVIDE COMPLETE LUMINAIRES INCLUDING LAMP(S) AND ALL SOCKETS, BALLASTS, DRIVERS, REFLECTORS, LENSES, HOUSINGS AND OTHER COMPONENTS REQUIRED TO POSITION, ENERGIZE AND PROTECT THE LAMP AND DISTRIBUTE THE LIGHT.
 - 5. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED CONDUIT, BOXES, WIRING, CONNECTORS, HARDWARE, SUPPORTS, TRIMS, ACCESSORIES, ETC. AS NECESSARY FOR A COMPLETE OPERATING SYSTEM.
 - 6. CONDUIT OR PLASTER FRAMING FOR LUMINAIRES RECESSED IN PLASTER CEILINGS.
 - A. CONTROL INPUT
 - a. 0-10V DC VOLTAGE CONTROLLED DIMMING DRIVERS: CONNECT TO DEVICES COMPATIBLE WITH 0 TO 10V ANALOG CONTROL PROTOCOL, CLASS 2, CAPABLE OF SINKING 0.6 MA PER DRIVER AT A LOW END OF 0.3V. LIMIT THE NUMBER OF DRIVERS ON EACH 10V CONTROL OUTPUT BASED ON VOLTAGE DROP AND CONTROL CAPACITY.
 - b. DRIVER: APPROVED BY DIMMING SYSTEM MANUFACTURER AS SUITABLE FOR OPERATION WITH CONTROL UNIT AND SUITABLE FOR LED SOURCE TYPE AND QUANTITY SPECIFIED FOR LUMINAIRE.



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STATUS:

ISSUED FOR BIDDING

REVISIONS:

MARK	DATE	DESCRIPTION
Δ		

TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS
525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21
2021248.00 - CHESHIRE HIGH SCHOOL - HVAC
ARCH\TITLE BLOCK

AUTHOR: MA
DRAFTER: MA
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

FIRE PROTECTION
ABBREVIATIONS, NOTES AND
SYMBOLS

SHEET NUMBER:

FP0.00

GENERAL NOTES

- THESE GENERAL NOTES ARE APPLICABLE TO ALL FIRE PROTECTION DRAWINGS.
- DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL INTENT OF WORK. SEE DETAILS, RISERS, AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- THE DRAWINGS INDICATE A SUGGESTED SPRINKLER HEAD LAYOUT AND THAT EACH AREA IS COVERED BY SPRINKLER PROTECTION AS REQUIRED BY ALL APPLICABLE CT BUILDING AND FIRE CODES. THE SPRINKLER QUANTITIES SHALL NOT BE COUNTED AS A TAKE OFF OR AS EXACT LOCATIONS. EXACT SPACING, DENSITY, AND LOCATION REQUIREMENTS SHALL BE AS DICTATED BY NFPA 13. FINAL LOCATIONS OF SPRINKLER HEADS SHALL BE COORDINATED WITH THE ARCHITECT.
- THE CONTRACTOR SHALL PERFORM A FLOW TEST. INFORMATION FROM THE CONTRACTOR'S FLOW TEST SHALL BE USED FOR HYDRAULIC CALCULATIONS.
- FIRE PROTECTION CONTRACTOR SHALL PROVIDE HYDRAULIC CALCULATIONS. HYDRAULIC CALCULATIONS SHALL INCLUDE A SAFETY FACTOR OF 10%. COMBINED INSIDE AND OUTSIDE HOSE STREAM ALLOWANCE FOR HYDRAULIC CALCULATIONS SHALL BE 250 GPM.
- THE CONTENT OF THESE DRAWINGS IS INTENDED TO SATISFY THE BUILDING CODE REQUIREMENTS FOR CONSTRUCTION DOCUMENTS. WHEN STAMPED AND SEALED BY THE ENGINEER OF RECORD, THEY ARE INTENDED TO BE USED AS PART OF THE BUILDING PERMIT APPLICATION ONLY.
- FIRE SUPPRESSION SYSTEM SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO CONSTRUCTION. PROVIDE A COMPLETE SHOP DRAWING SUBMITTAL INCLUSIVE OF ALL INFORMATION REQUIRED BY STATE BUILDING CODE, NFPA 13 AND THE CONSTRUCTION DOCUMENTS.
- PREPARE A COMPLETE RECORD SUBMITTAL INCLUSIVE OF ALL FIELD CHANGES AND ALL INFORMATION REQUIRED BY THE STATE BUILDING CODE AND CONSTRUCTION DOCUMENTS.
- SHOP DRAWINGS AND RECORD DRAWING SUBMITTALS SHALL BE PREPARED BY THE CONTRACTOR'S QUALIFIED DESIGNER AND SHALL INDICATE THE DESIGNER'S NICET CERTIFICATION NUMBER OR PROFESSIONAL ENGINEERING SEAL AND SIGNATURE.
- THE ENGINEER OF RECORD WILL NOT SIGN AND SEAL SHOP DRAWINGS OR RECORD DRAWINGS PREPARED BY THE CONTRACTOR. WHERE THE AUTHORITY HAVING JURISDICTION REQUIRES SHOP DRAWING OR RECORD DRAWING SUBMITTALS TO BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, THE SUBMITTALS SHALL BE PREPARED BY A QUALIFIED PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR.
- THE SHOP DRAWINGS, SUPPLEMENTAL CALCULATIONS AND MATERIAL SUBMITTALS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD PRIOR TO SUBMITTAL TO THE STATE DIVISION OF ENGINEERING AND BUILDINGS.
- INSTALLATION OF SPRINKLERS SHALL BE BASED ON THE DESIGN CRITERIA BELOW

SPRINKLER SYSTEM DESIGN CRITERIA - NFPA 13

AREA	OCCUPANCY CLASSIFICATION	DENSITY (GPM/SF)	AREA OF APPLICATION (SF)	MAX. AREA PER SPRINKLER (SF)
CLASSROOM	ORDINARY HAZARD I	0.10	1500	225

VALVE AND SYMBOL LEGEND

SYMBOL	DESCRIPTION
	BALL VALVE
	BALL VALVE WITH HOSE BIBB, CAP & CHAIN (DRAIN VALVES)
	BUTTERFLY VALVE
	GATE VALVE
	OS&Y VALVE
	PRESSURE REDUCING VALVE
	CHECK VALVE
	STRAINER W/BALL VALVE, HOSE BIBB & CAP
	SAFETY RELIEF VALVE
	FLOW SWITCH
	PRESSURE GAUGE
	THERMOMETER
	DOUBLE CHECK VALVE ASSEMBLY
	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY AND DRAIN
	ALARM BELL
	"WET" ALARM VALVE RISER
	"DRY" ALARM VALVE RISER
	"DRY" PREACTION, DELUGE VALVE RISER
	ANGLE VALVE
	SIGHT GLASS
	FIRE DEPARTMENT CONNECTION
	POST INDICATOR VALVE
	FLUSH MOUNTED FIRE PUMP TEST HEADER
	SURFACE MOUNTED FIRE PUMP TEST HEADER
	POST MOUNTED FIRE DEPARTMENT CONNECTION
	STORZ FIRE DEPARTMENT CONNECTION
	TAMPER SWITCH
	PRESSURE SWITCH
	AUTOMATIC TRANSFER SWITCH
	FIRE PUMP CONTROLLER
	JOCKEY PUMP CONTROLLER
	PREACTION ALARM ASSEMBLY CABINET
	HOSE VALVE CABINET

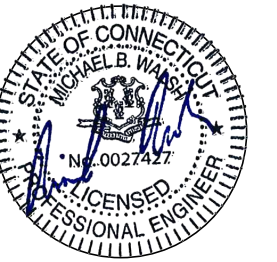
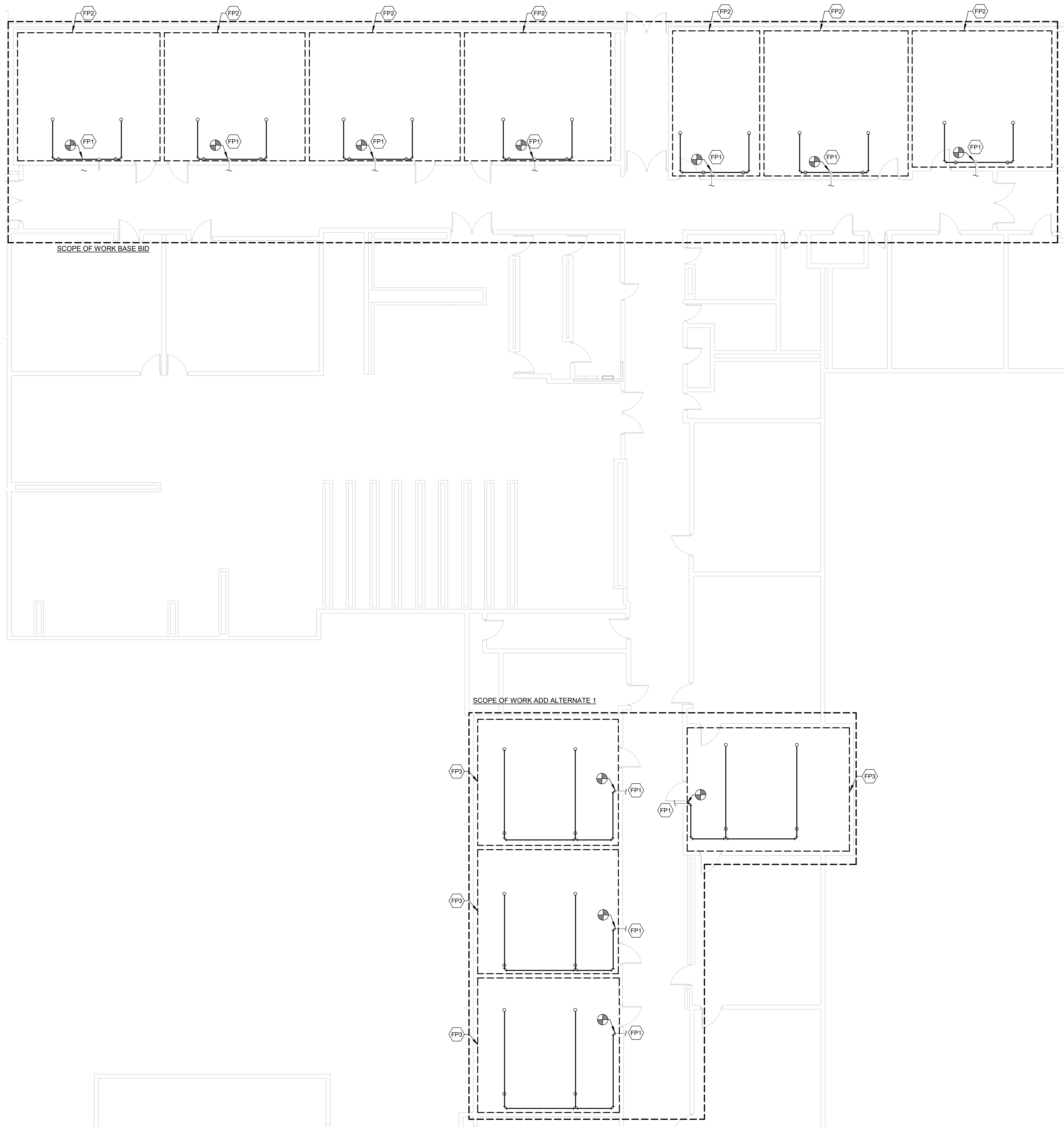
PIPING LEGEND

SYMBOL	DESCRIPTION
	SPRINKLER MAIN (DRY)
	PIPE RISE
	PIPE DROP
	PIPE TEE TOWARDS (UP IN PLAN)
	PIPE TEE AWAY (DOWN IN PLAN)
	PIPE DROP AND RUN
	DIRECTION OF FLOW
	BLIND FLANGE
	END CAP
	REDUCER (ECCENTRIC)
	REDUCER (CONCENTRIC)
	FLEXIBLE CONNECTION

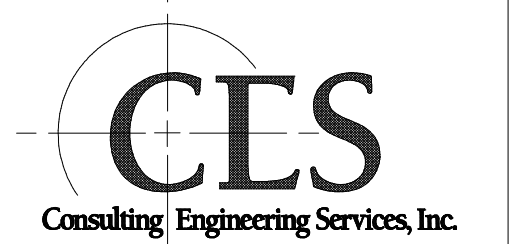
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
ATS	AUTOMATIC TRANSFER SWITCH
CR	CORROSION RESISTANT
D	DRY
DCV	DOUBLE CHECK VALVE
EC	EXTENDED COVERAGE
ELEV	ELEVATION
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DEPARTMENT
FDC	FIRE DEPARTMENT CONNECTION
FHV	FIRE HOSE VALVE
FP	FIRE PROTECTION
FPC	FIRE PUMP CONTROLLER
FS	FEET PER MINUTE
FS	FLOW SWITCH
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	TOTAL DEVELOPED HEAD
HTC	HIGH TEMPERATURE CLASSIFICATION
HVC	HOSE VALVE CABINET
ITC	INTERMEDIATE TEMPERATURE CLASSIFICATION
JP	JOCKEY PUMP
JPC	JOCKEY PUMP CONTROLLER
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OS&Y	OUTSIDE STEM AND YOKE
PA	PREACTION
PAC	PREACTION ALARM VALVE CABINET
PD	PRESSURE DROP
PIV	PRESSURE INDICATOR VALVE
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
SS	SUPERVISORY SWITCH
TS	TAMPER SWITCH
TYP	TYPICAL
V	VOLTS
VEL	VELOCITY
WG	WIRE GUARD

FIRE PROTECTION KEY NOTES	
FP1	APPROXIMATE LOCATION OF ETR FIRE PROTECTION MAIN TO SERVE CLASSROOM FROM CORRIDOR FIRE PROTECTION MAIN. CONTRACTOR TO CONFIRM EXACT LOCATION IN FIELD.
FP2	PROVIDE UPRIGHT/SIDEWALL TYPE SPRINKLER HEADS ABOVE AND BELOW EXPOSED DUCTWORK PER NFPA 13 REQUIREMENTS. COORDINATE SPRINKLERS AND SPRINKLER PIPING WITH DIVISION 23.
FP3	PROVIDE UPRIGHT TYPE SPRINKLER HEADS WITH INSTALLED DUCTWORK DESIGN AND ENSURE NFPA 13 OBSTRUCTION REQUIREMENTS ARE MET.



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STATUS:
ISSUED FOR BIDDING

REVISIONS:

MARK	DATE	DESCRIPTION
Δ	.	.

TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS
525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21
2021248.00 - CHESHIRE HIGH SCHOOL - HVAC
ARCH\TITLE BLOCK

AUTHOR: MA
DRAFTER: MA
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

FIRE PROTECTION FLOOR
PLAN

SHEET NUMBER:

FP1.00

21 00 00 - GENERAL

- A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.
- B. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC., AND COORDINATE WITH OTHER TRADES INVOLVED.
- C. DESCRIPTION
 - 1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT SHALL PROCEED IN A MANNER THAT MINIMIZES ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
 - 2. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.
- D. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT
 - 1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS"
 - 2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
 - 3. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
 - 4. REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
 - 5. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND/OR METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT.
- E. DRAWINGS
 - 1. DRAWINGS ARE DIAGRAMMATIC. THE FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS, THOUGH SOME OFFSETS & TRANSITIONS MAY BE SHOWN IN PIPING & SHEET METAL TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING & SHEET METAL OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE WORK AND PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.
- F. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING:
 - 1. NFPA 13 - INSTALLATION OF SPRINKLER SYSTEMS.
 - 2. STATE BUILDING AND FIRE CODES.
 - 3. LOCAL AUTHORITIES HAVING JURISDICTION.
- G. PERMITS AND FEES:
 - 1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS IN CONNECTION WITH THE WORK. FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION. OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.
- H. EXISTING SYSTEMS AND EQUIPMENT
 - 1. EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.
 - 2. CONNECT WORK TO VARIOUS EXISTING SYSTEMS AS INDICATED ON THE DRAWINGS. WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEM CONDITIONS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED AS WELL AS WITH EXISTING SYSTEMS, THE STRUCTURE, AND OTHER OBSTRUCTIONS.
- I. SURVEY AND MEASUREMENTS
 - 1. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, SHALL BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT IS DESCRIBED. NO CHANGES OR EXTENSION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS.
 - 2. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
 - 3. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. IF BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
 - 4. CONTRACTORS SHALL VERIFY, LAYOUT AND BE RESPONSIBLE FOR ALL MEASUREMENTS OF ALL EXISTING CONDITIONS BEFORE COMMENCING WORK AND SHALL NOTIFY ARCHITECT AND/OR ENGINEER IF A CONDITION EXISTS THAT PREVENTS THE CONTRACTOR FROM ACCOMPLISHING THE INTENT OF THE DRAWINGS.
- J. SUBMITTALS AND SHOP DRAWINGS
 - 1. SUBMIT FOR REVIEW, ELECTRONIC SHOP DRAWINGS IN SEARCHABLE PDF FORMAT FOR THE FOLLOWING.
 - a. SUBMITTAL DATA FOR ALL MATERIAL AND EQUIPMENT. CLEARLY IDENTIFY DEVIATIONS OF THE SUBMITTED PRODUCTS FROM THE DESIGN.
 - b. SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'-0". 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 CONSIDERED SHOP DRAWINGS.
 - c. HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13.
 - 2. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
 - 3. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SUBMITTALS.
 - 4. SCHEDULE AT LEAST TEN WORKING DAYS EXCLUSIVE OF TRANSMITTAL TIME, FOR SUBMITTAL REVIEW.
- K. AS-BUILT DRAWINGS
 - 1. MAINTAIN ONE SET OF PRINTS ON THE SITE AND NOTE ALL CHANGES OR DEVIATIONS FROM THE ORIGINAL DESIGN THEREON. AT THE COMPLETION OF THE PROJECT, INCORPORATE ALL CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.
- L. OPERATION AND MAINTENANCE
 - 1. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.
 - 2. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
 - 3. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.
- M. CLEANING
 - 1. EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.
 - 2. WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.
- N. GUARANTEE
 - 1. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD. PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.

N. MEANS AND METHODS ALL TRADES

- 1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 2. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
- 3. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
- 4. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
- 5. SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
- 6. EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS
- 7. WATERPROOFING: WHERE ANY WORK PIECES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL AND FLOORS IN WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.
- 8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRESTOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814.
- 9. PROVIDE ACCESS PANELS IN WALLS, FLOORS AND GYPSUM WALL BOARD CEILINGS TO ALLOW ACCESS TO VALVES AND OTHER APPARATUS AND EQUIPMENT REQUIRING PERIODIC SERVICE AND INSPECTION. NOT ALL ACCESS PANELS ARE INDICATED ON THE PLANS. REVIEW ARCHITECTURAL AND MECHANICAL PLANS TO DETERMINE THE LOCATION AND QUANTITY OF ACCESS PANELS REQUIRED. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.

21 05 00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION SYSTEMS

- A. WORKMANSHIP AND QUALIFICATIONS: MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NFPA AND APPLICABLE LOCAL CODES AND ORDINANCES. THE SPRINKLER CONTRACTOR SHALL BE STATE LICENSED TO INSTALL SPRINKLER SYSTEMS. FIRE PROTECTION DEVICES USED SHALL BE LISTED AND APPROVED BY UNDERWRITERS LABORATORIES (UL) AND/OR FACTORY MUTUAL (FM).
- B. GROOVED JOINT COUPLINGS, FITTINGS, VALVES, AND SPECIALTIES SHALL BE THE PRODUCTS OF A SINGLE MANUFACTURER. GROOVING TOOLS SHALL BE OF THE SAME MANUFACTURER AS THE GROOVED COMPONENTS.
- C. VALVES: SHALL BEAR UL AND/OR FM LABEL OR MARKING. PROVIDE MANUFACTURER'S NAME AND PRESSURE RATINGS MARKED ON VALVE BODY. ITEMS OF SIMILAR CLASS SHALL BE THE PRODUCTS OF THE SAME MANUFACTURER. MANUFACTURERS: KENNEDY VALVE MFG. CO., VICTAULIC, STOCKHAM, NIBCO, WATTS, HAMMOND, MILWAUKEE.
- D. PIPE & FITTINGS (ABOVE GRADE)
 - 1. STEEL PIPING: ASTM A53, SCHEDULE 40 SEAMLESS CARBON STEEL. SCHEDULE 10 PIPE SHALL BE ALLOWED FOR PIPE SIZES LARGER THAN 1-1/4" DIAMETER WHEN ROLL GROOVED MECHANICAL COUPLINGS ARE USED.
 - 2. CAST IRON FITTINGS: ANSI/ASME B16.1, FLANGES AND CLANGED FITTINGS, ANSI/ASME B16.4, SCREWED FITTINGS.
 - 3. MALLEABLE IRON FITTINGS: ANSI/ASME B16.3, SCREWED FLANGE 300 TYPE. THREADS SHALL CONFORM TO ANSI/ASTM A47.
 - 4. GROOVED MECHANICAL FITTINGS: ANSI A21.10/AWWA C-110 DUCTILE IRON, ASTM A536 GRADE 65-45-12 DUCTILE IRON, ASTM A244 GRADE WPB, OR FACTORY FABRICATED FROM CARBON STEEL PIPE CONFORMING TO ASTM A53, WITH GROOVES OR SHOULDERS DESIGNED TO ACCEPT GROOVED END COUPLINGS. FITTINGS SHALL BE OF THE SAME MANUFACTURER AS THE ADJOINING COUPLINGS.
 - 5. GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING, ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL GROOVED PIPE AND FITTINGS.
 - 6. RIGID TYPE COUPLINGS: HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN BOLT PADS TO PROVIDE RIGIDITY AND SYSTEM SUPPORT AND HANGING IN ACCORDANCE WITH NFPA-13.
 - a. 1-1/4" THROUGH 4": FACTORY ASSEMBLED FOR INSTALLATION WITHOUT FIELD DISASSEMBLY. VICTAULIC STYLE 009 EZ.
 - b. 5" THROUGH 8": VICTAULIC FIRELOCK STYLE 005.
 - c. 10" AND LARGER: VICTAULIC ZERO-FLEX STYLE 07.
 - 7. FLEXIBLE TYPE COUPLINGS: USE IN LOCATIONS WHERE VIBRATION ATTENUATION AND STRESS RELIEF ARE REQUIRED, AND FOR SEISMIC CONSIDERATIONS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. VICTAULIC STYLE 75.
- E. GASKETS
 - 1. WET SYSTEMS: C-SHAPE OR EZ STYLE 009.
- F. JOINTS
 - 1. GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING, FLUSH/SEAL OR QUICKVIC ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL GROOVED PIPE AND FITTINGS. HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN BOLT PADS TO PROVIDE RIGIDITY, AND MANUFACTURED TO CONNECT COPPER TUBING AND FITTINGS WITHOUT FLARING. VICTAULIC STYLE 606 OR STYLE 607 QUICKVIC STAB-ON COUPLINGS.
 - 2. ASTM B32, SOLDER, GRADE 95TA OR ANSI/AWS A5 8CUP SILVER BRAZE.
 - 3. CAST IRON: AWWA C111 PIPING WITH AWWA C110 STANDARD THICKNESS FITTINGS AND AWWA C111 RUBBER GASKET JOINTS OR MECHANICAL GROOVED COUPLINGS WITH DUCTILE IRON HOUSING CLAMPS TO ENGAGE AND LOCK. "C" SHAPED COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS, GALVANIZED FOR GALVANIZED PIPE.
- G. DRAIN VALVES: COMPRESSION STOP: BRONZE WITH HOSE THREAD NIPPLE AND CAP.
- H. BALL VALVE: BRASS WITH CAP AND CHAIN, 3/4" HOSE THREAD
- I. UNIONS & DIELECTRIC CONNECTIONS
 - 1. UNIONS FOR PIPE 2" AND UNDER:
 - a. FERROUS PIPING: 150 PSIG (1034 KPA) MALLEABLE IRON, THREADED.
 - b. COPPER PIPE: BRONZE, SOLDERED JOINTS.
 - 2. DIELECTRIC CONNECTIONS: WATERWAY FITTING WITH WATER IMPERVIOUS ISOLATION BARRIER, VICTAULIC STYLE 47 OR APPROVED EQUAL.
- J. PIPE HANGERS AND SUPPORTS
 - 1. CONFORM TO NFPA 13.
 - 2. HANGERS: MALLEABLE IRON, CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING, CARBON STEEL, ADJUSTABLE, CLEVIS.
 - 3. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.
 - 4. WALL SUPPORT FOR PIPE SIZES TO 3": CAST IRON HOOK.
 - 5. WALL SUPPORT FOR PIPE SIZES 4" AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP.
 - 6. VERTICAL SUPPORT: STEEL RISER CLAMP (ANGLE RING).
 - 7. FLOOR SUPPORT: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.

R. GENERAL INSTALLATION REQUIREMENTS FOR PIPE AND FITTINGS

- 1. INSTALL PIPING IN ACCORDANCE WITH NFPA 13 FOR SPRINKLER SYSTEMS.
- 2. PLACE PIPING IN CONCEALED SPACES ABOVE FINISHED CEILINGS UNLESS NOTED OTHERWISE.
- 3. ROUTE PIPING IN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT.
- 4. INSTALL PIPING TO CONSERVE BUILDING SPACE, TO NOT INTERFERE WITH USE OF SPACE AND OTHER WORK.
- 5. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
- 6. INSTALL PIPE SLEEVE AT PIPING PENETRATIONS THROUGH FOOTINGS, PARTITIONS, WALLS, AND FLOORS. SEAL PIPE AND SLEEVE PENETRATIONS TO MAINTAIN FIRE RESISTANCE EQUIVALENT TO FIRE SEPARATION.
- 7. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE. JOINTS, OR CONNECTED EQUIPMENT, USE VICTAULIC STYLE 77 OR 75 COUPLINGS IN ACCORDANCE WITH VICTAULIC INSTRUCTIONS FOR EXPANSION AND CONTRACTION OF PIPE.
- 8. GROOVED JOINT COUPLINGS AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. GROOVED ENDS SHALL BE CLEAN AND FREE FROM INDENTATIONS, PROJECTIONS, AND ROLL MARKS IN THE AREA FROM PIPE END TO GROOVE. GASKETS SHALL BE VERIFIED AS SUITABLE FOR THE INTENDED SERVICE PRIOR TO INSTALLATION. GASKETS SHALL BE MOLDED AND PRODUCED BY THE COUPLING MANUFACTURER. THE GROOVED COUPLING MANUFACTURER'S FACTORY TRAINED REPRESENTATIVE SHALL PROVIDE ON-SITE TRAINING FOR CONTRACTOR'S FIELD PERSONNEL IN THE USE OF GROOVING TOOLS, APPLICATION OF GROOVE, AND INSTALLATION OF GROOVED JOINT PRODUCTS. THE MANUFACTURER'S REPRESENTATIVE SHALL PERIODICALLY VISIT THE JOBSITE AND REVIEW INSTALLATION. CONTRACTOR SHALL REMOVE AND REPLACE ANY JOINTS DEEMED IMPROPERLY INSTALLED.
- 9. PITCH PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE LEVEL.
- 10. PREPARE PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING, WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC-RICH PRIMER TO WELDING.
- 11. DO NOT PENETRATE BUILDING STRUCTURAL MEMBERS UNLESS INDICATED.
- 12. WHERE MORE THAN ONE PIPING SYSTEM MATERIAL IS SPECIFIED, INSTALL COMPATIBLE SYSTEM COMPONENTS AND JOINTS. INSTALL FLANGES, UNION, AND COUPLINGS AT LOCATIONS REQUIRING SERVICING.
- 13. DIE CUT THREADED JOINTS WITH FULL CUT STANDARD TAPER PIPE THREADS WITH RED LEAD AND UNSEED OIL OR OTHER NON-TOXIC JOINT COMPOUND APPLIED TO MALE THREADS ONLY.
- 14. PROVIDE DIELECTRIC FITTINGS WHENEVER JOINING TWO DISSIMILAR METALS.
- 15. PROVIDE SURGE RESTRAINERS ON ALL END OF BRANCHES AND ARM OVERS IN EXCESS OF 12".
- S. GENERAL INSTALLATION REQUIREMENTS FOR VALVES
 - 1. INSTALL DRAIN VALVES AT MAIN SHUT-OFF VALVES, LOW POINTS OF PIPING AND APPARATUS.
 - 2. VALVES SHALL BE ACCESSIBLE FOR OPERATION AND SERVICING. PROVIDE ACCESS PANELS WHERE REQUIRED.
 - 3. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED. REMOVE PROTECTIVE COATINGS AFTER INSTALLATION.
 - 4. INSTALL BURIED SHUT OFF VALVES IN VALVE BOX.
- T. GENERAL INSTALLATION REQUIREMENTS FOR PIPE HANGERS AND SUPPORTS
 - 1. INSTALL IN ACCORDANCE WITH NFPA 13.
 - 2. INSTALL HANGERS TO WITH MINIMUM 1/2" SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
 - 3. PLACE HANGERS WITHIN 12" OF EACH HORIZONTAL ELBOW.
 - 4. USE HANGERS WITH 1-1/2" MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
 - 5. SUPPORT VERTICAL PIPING AT EVERY FLOOR. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
 - 6. WHERE INSTALLING SEVERAL PIPES IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
 - 7. INSTALL COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
 - 8. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
- U. TESTING: PRESSURE TEST THE ABOVE GROUND SYSTEM IN ACCORDANCE TO NFPA 13. TESTING SHALL BE COMPLETED PRIOR TO PERMANENT SEALING OF WALLS AND PARTITIONS. PRESSURE TEST BELOW GRADE PIPING IN ACCORDANCE WITH NFPA 24.
- E. GENERAL INSTALLATION REQUIREMENTS FOR SPRINKLER SYSTEMS
 - 1. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - 2. INSTALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13, NFPA 13A, NFPA 13R, AND NFPA 24 FOR SERVICE MAINS.
 - 3. MINIMIZE SHUT-DOWNS OF EXISTING WATER SUPPLIES. WORK SHALL BE COMPLETE BEFORE MAKING THE FINAL CONNECTIONS TO THE EXISTING WATER SUPPLIES. NOTIFY THE OWNER'S REPRESENTATIVE BEFORE AFFECTING THE OPERATION OF ANY EXISTING FIRE PROTECTION EQUIPMENT.
 - 4. LOCATE FIRE DEPARTMENT CONNECTION WITH SUFFICIENT CLEARANCE FROM WALLS, OBSTRUCTIONS, ETC., TO ALLOW FULL SWING OF FIRE DEPARTMENT WRENCH HANDLE. COORDINATE THE LOCATION OF THE FIRE DEPARTMENT CONNECTION WITH THE LOCAL FIRE OFFICIALS.
 - 5. SPRINKLERS LOCATED IN FULL SIZE CEILING TILES SHALL BE CENTERED IN THE TILE. PROVIDE PIPING OFFSETS AS REQUIRED.
 - 6. SPRINKLER BULB PROTECTOR SHALL REMAIN IN PLACE UNTIL THE SPRINKLER IS COMPLETELY INSTALLED. REMOVE THE BULB PROTECTOR BY HAND AFTER INSTALLATION AND BEFORE THE SYSTEM IS PLACED IN SERVICE.
 - 7. COORDINATE FLOW SWITCHES, TAMPER SWITCHES, AND ALL OTHER SPRINKLER DEVICES WITH THE FIRE ALARM SYSTEM.
 - 8. PROVIDE AND APPLY SIGNS TO CONTROL, DRAIN, TEST AND ALARM VALVES TO IDENTIFY THEIR PURPOSE AND FUNCTION.

- 21 13 10 - FIRE-SUPPRESSION SPRINKLER SYSTEMS
- A. SYSTEM DESCRIPTION (EXISTING BUILDING)
 - 1. PROVIDE A WET PIPE SYSTEM HYDRAULICALLY DESIGNED IN ACCORDANCE WITH NFPA 13 AND ALL REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION, TO PROVIDE COVERAGE FOR SPACES INDICATED ON THE DRAWINGS.
 - 2. PROVIDE ALTERATIONS AND RENOVATIONS TO THE EXISTING SPRINKLER SYSTEM. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS INCLUDING BUT NOT LIMITED TO: LOCATION OF THE EXISTING SPRINKLER HEADS, LOCATIONS AND SIZES OF EXISTING SPRINKLER PIPING, AVAILABLE STATIC PRESSURE, RESIDUAL PRESSURE, AND FLOW AT THE BASE OF THE RISER. MODIFY SPRINKLER PIPING AS REQUIRED FOR THE LAYOUT OF NEW SPRINKLER HEADS, INCLUDING MODIFICATIONS TO EXISTING PIPING.
 - 3. HYDRAULIC DATA AND WATER SUPPLY INFORMATION PROVIDED ON THE PLANS FOR REFERENCE ONLY. CONTRACTOR SHALL PERFORM A WATER FLOW TEST. RESULTS OF THE CONTRACTORS WATER FLOW TEST SHALL BE USED FOR PREPARING HYDRAULIC CALCULATIONS.
 - 4. INTERFACE SYSTEM WITH BUILDING FIRE ALARM SYSTEM.
 - 5. THE SPRINKLER LOCATIONS AND PIPING ARRANGEMENTS INDICATED ON THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC.
 - 6. SPRINKLER LOCATIONS INDICATED ARE FOR STANDARD COVERAGE SPRINKLERS, MAXIMUM 225 SQUARE FEET PER SPRINKLER FOR LIGHT HAZARD AND 130 SQUARE FEET PER SPRINKLER FOR ORDINARY HAZARD. EXTENDED COVERAGE SPRINKLERS SHALL NOT BE INSTALLED IN ANY LOCATIONS UNLESS SPECIFICALLY INDICATED.
- B. SUBMITTALS
 - 1. SUBMIT FIRE PROTECTIONS SHOP DRAWINGS DRAWN TO A MINIMUM SCALE OF 1/4"=1'-0". DRAWINGS SHALL INCLUDE DETAILED PIPE LAYOUT, PIPE MATERIALS USED, JOINING METHODS, HANGERS AND SUPPORTS, FLOOR AND WALL PENETRATION SEALS, CONTROLS, AND COMPONENTS AND ACCESSORIES.
 - 2. SUBMIT HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH NFPA 13.
 - 3. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.
 - 4. PRODUCT DATA: SUBMIT DATA ON SPRINKLERS, VALVES, AND SPECIALTIES.
 - 5. AFTER REVIEW BY THE OWNER'S REPRESENTATIVE, SUBMIT SPRINKLER LAYOUT SHOP DRAWINGS, PRODUCT DATA, AND HYDRAULIC CALCULATIONS TO THE AUTHORITY HAVING JURISDICTION, FIRE MARSHAL, AND OWNER'S INSURANCE UNDERWRITER FOR APPROVAL. SUBMIT PROOF OF APPROVAL FROM SUCH AUTHORITIES/ORGANIZATIONS.
- C. SPRINKLERS
 - 1. MANUFACTURERS: VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP.
 - 2. SPRINKLERS SHALL BE ADJUSTABLE, GLASS BULB, AUTOMATIC SPRINKLERS WITH 1/2" ORIFICE AND 5.6 K-FACTOR UNLESS OTHERWISE INDICATED. TYPE OF SPRINKLER HEAD SHALL BE AS INDICATED ON THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING.
 - 3. SPRINKLER BODIES SHALL BE DIE CAST BRASS, WITH HEX SHAPED WRENCH BOSS INTEGRALLY CAST INTO THE SPRINKLER BODY TO REDUCE THE RISK OF DAMAGE DURING INSTALLATION.
 - 4. UNLESS OTHERWISE INDICATED, ORDINARY TEMPERATURE RATED SPRINKLER HEADS SHALL BE PROVIDED.
 - 5. WHERE SPRINKLERS WILL BE INSTALLED IN CLOSE PROXIMITY TO HEAT SOURCES AND SPECIAL LOCATIONS, AS IDENTIFIED IN NFPA 13, TEMPERATURE RATINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13.
 - 6. WHERE PLANS CALL FOR EXTENDED COVERAGE SPRINKLER HEADS, COORDINATE COVERAGE REQUIREMENTS WITH REQUIRED PRESSURE AND K-FACTOR.
 - 7. SPARE SPRINKLERS: FURNISH SPARE AUTOMATIC SPRINKLERS IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 FOR STOCK OF EXTRA SPRINKLERS. THE SPRINKLERS SHALL BE REPRESENTATIVE OF, AND IN PROPORTION TO, THE NUMBER OF EACH TYPE AND TEMPERATURE RATING OF THE SPRINKLERS INSTALLED. PROVIDE TWO SPECIAL SPRINKLER WRENCHES, OR MINIMUM ONE WRENCH FOR EACH CONTAINER OR SPRINKLER BOX, WHICHEVER IS GREATER.
 - 8. IN AREAS WHERE SPRINKLERS ARE SUBJECT TO PHYSICAL DAMAGE, PROVIDE SPRINKLER GUARD ASSEMBLY OVER HEAD. FINISH TO MATCH SPRINKLER FINISH. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SPRINKLERS IN ELEVATOR SHAFTS, UNDER LOWER RAKES OF STAIRWAYS, IN ELECTRICAL ROOMS, BOILER ROOMS AND OTHER MECHANICAL ROOMS, 7'-0" OR LESS ABOVE FINISHED FLOORS, AND IN GYMNASIUM/FITNESS CENTER AREAS.
- D. PIPING SPECIALTIES
 - 1. MANUFACTURERS: POTTER-ROEMER, VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. SUBSTITUTIONS: ALLOWED.
 - 2. WATER FLOW SWITCH: VANE TYPE SWITCH FOR MOUNTING HORIZONTAL OR VERTICAL, WITH TWO FORM C CONTACTS, RATED 10 AMP AT 120 VOLT. VANE TYPE WATER FLOW SWITCHES SHALL NOT BE USED ON DRY PIPE SPRINKLER SYSTEMS.
 - 3. PRESSURE SWITCH: 1/2" MALE PRESSURE CONNECTION TO ALARM VALVE RISER AND ACTUATED BY ANY FLOW OF WATER IN EXCESS OF ONE SPRINKLER. MAXIMUM PRESSURE RATINGS 175 PSI. WEATHER-PROOF WITH TAMPER RESISTANT SCREWS, RATED 10 AMPS AT 120 VOLT.
 - 4. PRESSURE GAGE: RATED FOR 300 PSI USE, 3-1/2" DIAMETER.



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STATUS:
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REVISIONS:

MARK	DATE	DESCRIPTION
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TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS
 525 South Main Street
 Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
 FILE SHEET SIZE: 24" x 36"

PLOT NAME:
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

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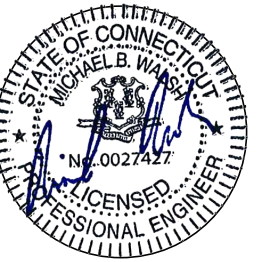
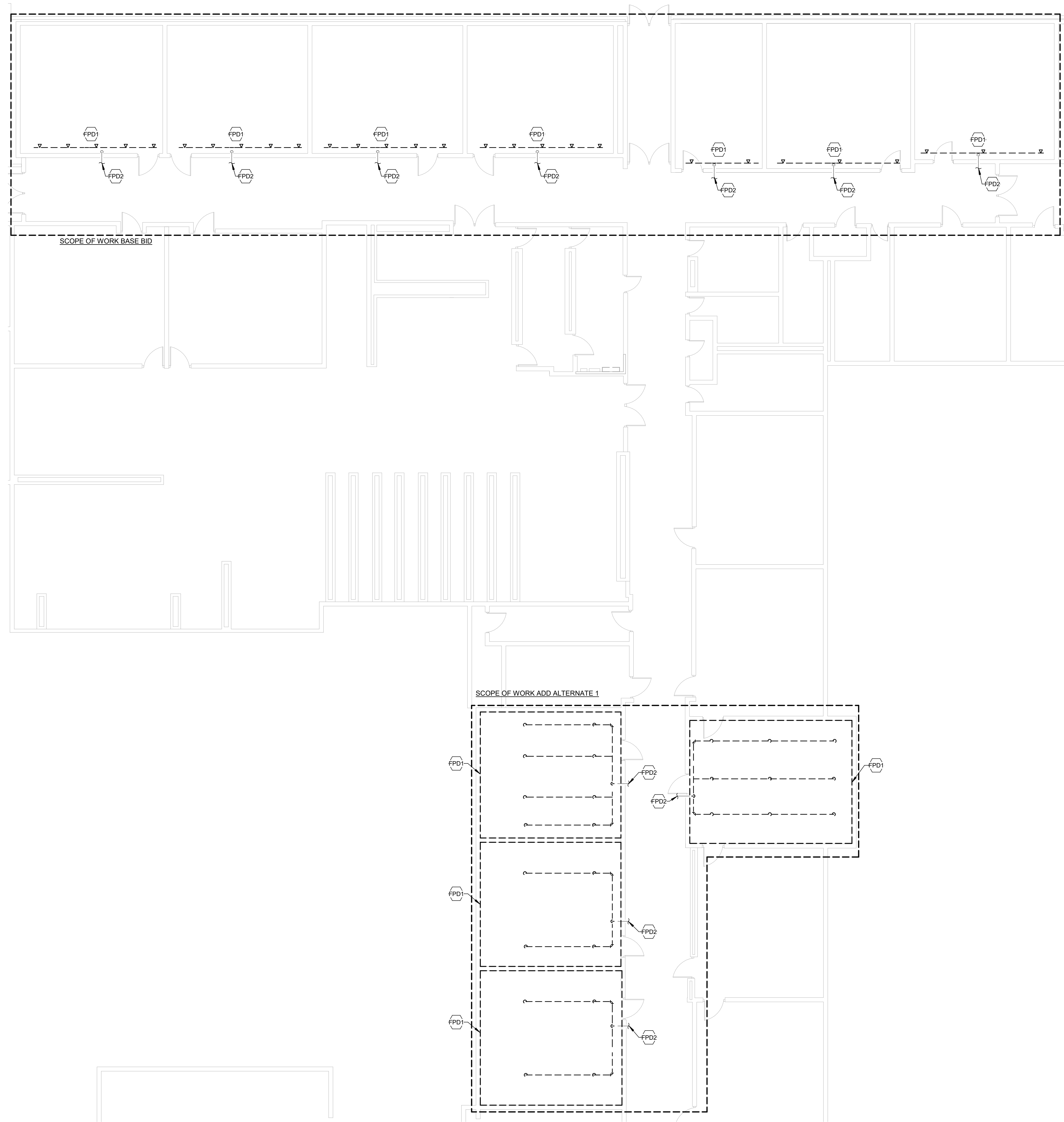
FIRE PROTECTION DRAWING SPECIFICATIONS

SHEET NUMBER:

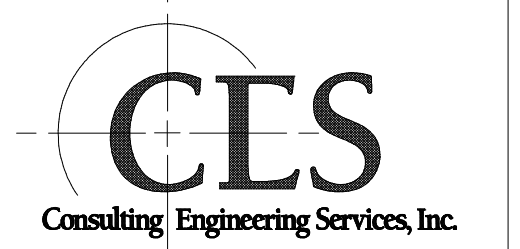
FP7.00

FIRE PROTECTION DEMOLITION KEY NOTES

-  REMOVE EXISTING SPRINKLERS AND ALL ASSOCIATED BRANCH PIPING AND FITTINGS BACK TO THE ETR FIRE PROTECTION MAIN. REFER TO DRAWING FP1.00 FOR SPRINKLER LAYOUT IN THIS AREA.
-  APPROXIMATE LOCATION OF ETR FIRE PROTECTION MAIN TO SERVE CLASSROOM FROM CORRIDOR FIRE PROTECTION MAIN. CONTRACTOR TO CONFIRM EXACT LOCATION IN FIELD.



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Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
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SHEET TITLE:

FIRE PROTECTION
DEMOLITION FLOOR PLAN

SHEET NUMBER:

FPD1.00

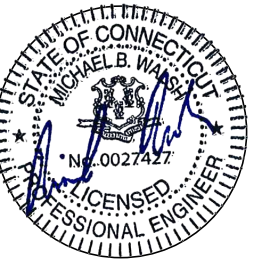
GENERAL NOTES - MECHANICAL

- REFER TO DRAWING M-6.00 FOR EQUIPMENT SCHEDULE AND DRAWING M-0.00 FOR EQUIPMENT SYMBOLS, LEGENDS, AND ABBREVIATIONS.
- PROVIDE FIRE STOPPING AND SMOKE BARRIER SEALING OF ALL PENETRATIONS THROUGH FIRE WALLS OR SMOKE BARRIERS AS REQUIRED. REFER TO ARCHITECTURAL FLOOR PLANS AND CODE SHEETS FOR WALLS.
- CONTRACTOR SHALL SALVAGE ALL CEILING TILES WHERE ANY CEILINGS ARE REMOVED FOR DEMOLITION AND NEW WORK.

SYMBOL	DESCRIPTION
	REMOVE EXISTING DUCTWORK/EQUIPMENT
	REMOVE EXISTING PIPING/EQUIPMENT
ETR	EXISTING TO REMAIN
RE	REMOVE EXISTING
RL	RELOCATE EXISTING
NL	NEW LOCATION

SYMBOLS	DESCRIPTION
	ANALOG INPUT
	ANALOG OUTPUT
	DIGITAL INPUT
	DIGITAL OUTPUT
	AQUASTAT
	TEMPERATURE SENSOR
	THERMOSTAT
	RELATIVE HUMIDITY SENSOR
	CARBON DIOXIDE SENSOR
	FLOW METER
	AIR FLOW MEASURING STATION
	CURRENT SENSING RELAY
	ENDSWITCH
	VARIABLE FREQUENCY DRIVE
	VFD BYPASS
	DIFFERENTIAL PRESSURE
	DIFFERENTIAL PRESSURE TRANSMITTER
	STATIC PRESSURE SENSOR
	AIR FLOW SWITCH

SYMBOL	DESCRIPTION
	DUCTWORK
	ACOUSTICALLY LINED DUCTWORK
	SUPPLY DUCTWORK TOWARDS (UP IN PLAN)
	SUPPLY DUCTWORK AWAY (DOWN IN PLAN)
	RETURN DUCTWORK TOWARDS (UP IN PLAN)
	RETURN DUCTWORK AWAY (DOWN IN PLAN)
	EXHAUST DUCTWORK TOWARDS (UP IN PLAN)
	EXHAUST DUCTWORK AWAY (DOWN IN PLAN)
	FLEXIBLE DUCT
	VOLUME DAMPER
	FIRE DAMPER
	BACKDRAFT DAMPER
	MOTORIZED DAMPER
	SMOKE DAMPER
	COMBINATION FIRE AND SMOKE DAMPER
	AIR ENTERING OPENING
	AIR LEAVING OPENING
	CEILING DIFFUSER (BLOW INDICATED)
	RETURN GRILLE OR REGISTER
	EXHAUST GRILLE OR REGISTER
	TEMPERATURE SENSOR
	THERMOSTAT
	DUCT SMOKE DETECTOR
	CARBON DIOXIDE SENSOR
	PIPE ELBOW TOWARDS (UP IN PLAN)
	PIPE ELBOW AWAY (DOWN IN PLAN)
	PIPE TEE TOWARDS (UP IN PLAN)
	PIPE TEE AWAY (DOWN IN PLAN)
	PIPE DROP & RUN
	HEATING WATER RETURN PIPING
	HEATING WATER SUPPLY PIPING
	CHILLED BEAM HOT WATER RETURN PIPING
	CHILLED BEAM HOT WATER SUPPLY PIPING
	CHILLED WATER RETURN PIPING
	CHILLED WATER SUPPLY PIPING
	CONDENSER WATER RETURN PIPING
	CONDENSER WATER SUPPLY PIPING
	CHILLED BEAM COLD RETURN PIPING
	CHILLED BEAM COLD SUPPLY PIPING
	GROUND WATER RETURN PIPING
	GROUND WATER SUPPLY PIPING
	RADON VENT PIPING
	FLOW DIRECTION
	PIPE ANCHOR
	PIPE GUIDE
	FLEXIBLE CONNECTION
	BALL VALVE
	TRANSFER DUCT SYMBOL
	TRANSFER GRILLE ASSEMBLY SYMBOL
	EQUIPMENT SYMBOL
	GRILLE/REGISTER/DIFFUSER SYMBOL
	KEYNOTE
	VAV TERMINAL UNIT SYMBOL
	DUCT SILENCER
	RADIANT CEILING PANEL SYMBOL
	CONNECTION TO EXISTING



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PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

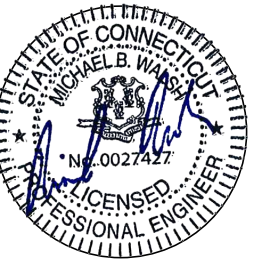
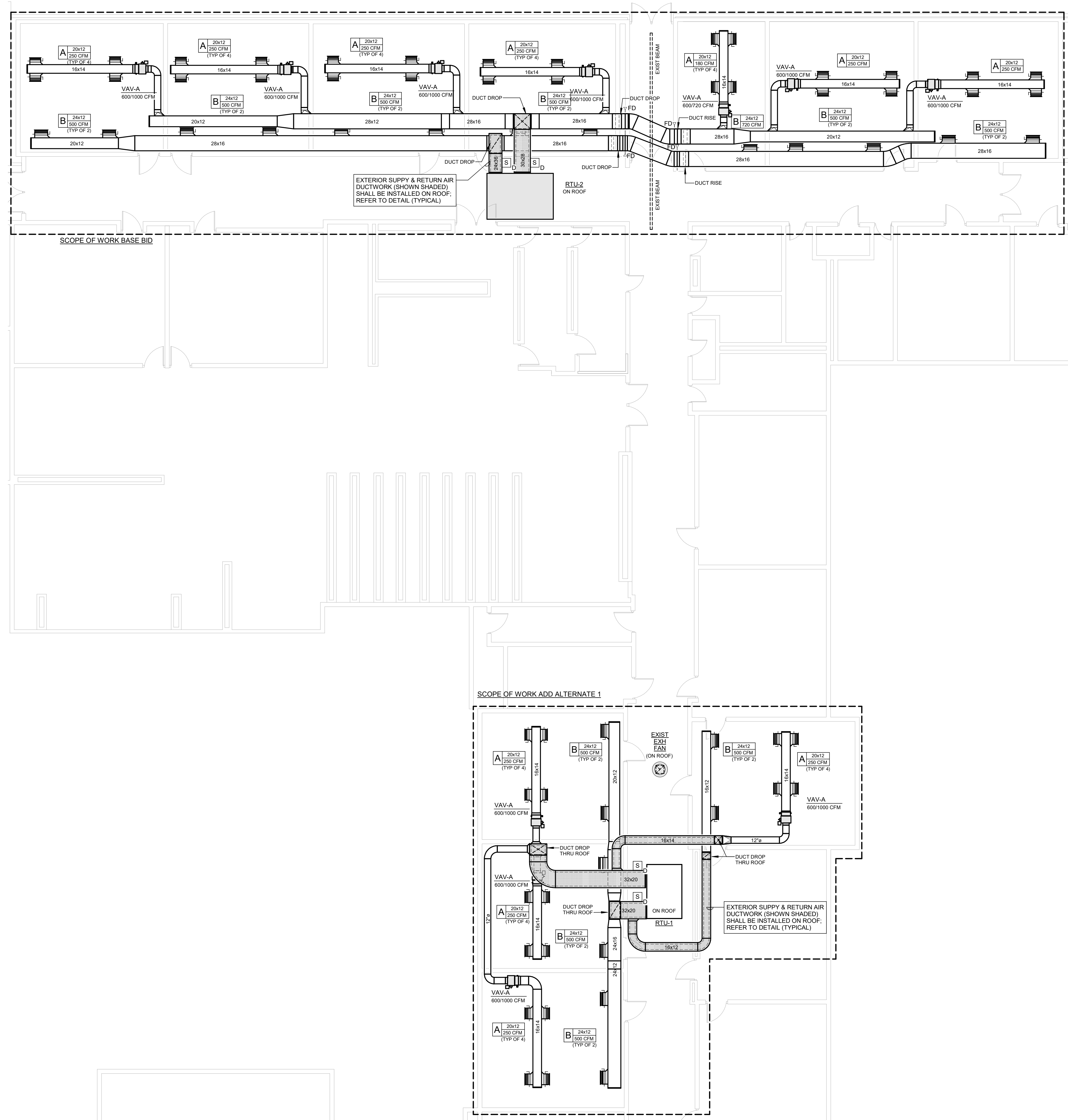
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AUTHOR: DH/AC
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SHEET TITLE:

MECHANICAL
ABBREVIATIONS, NOTES AND
SYMBOLS

SHEET NUMBER:

M0.00



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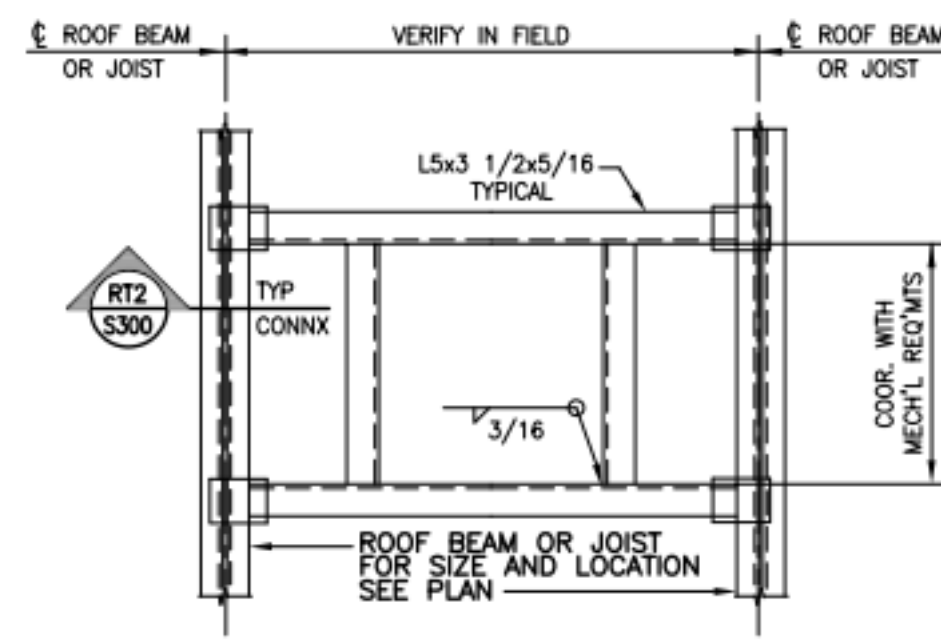
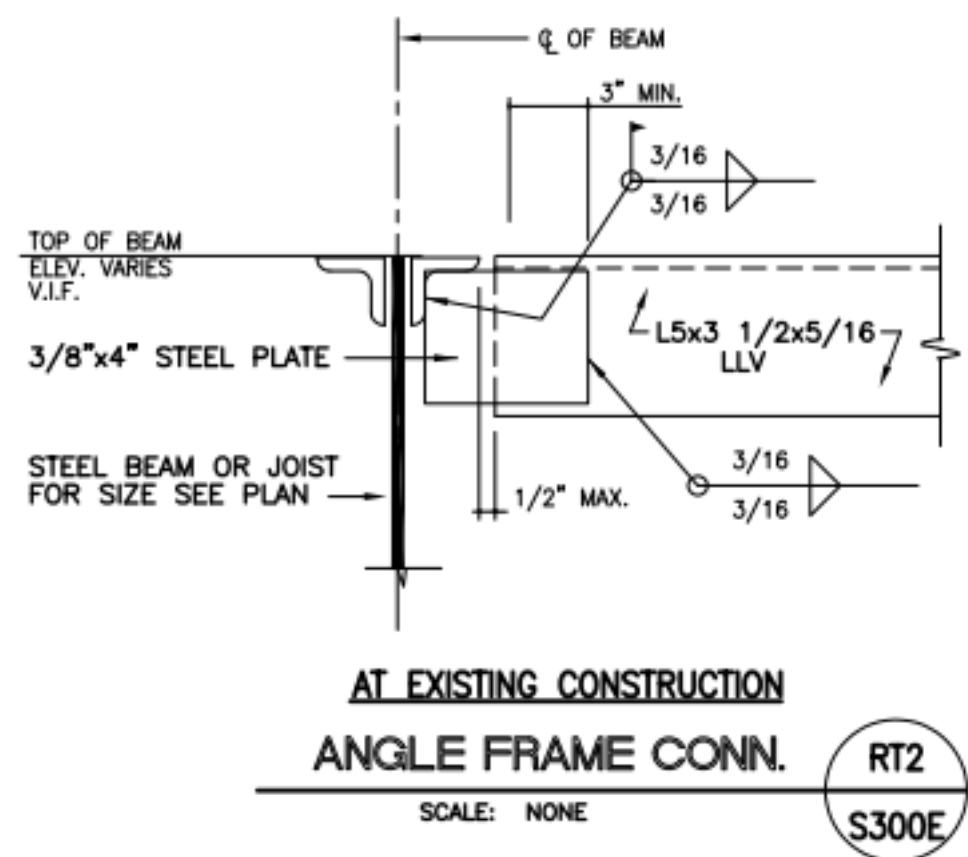
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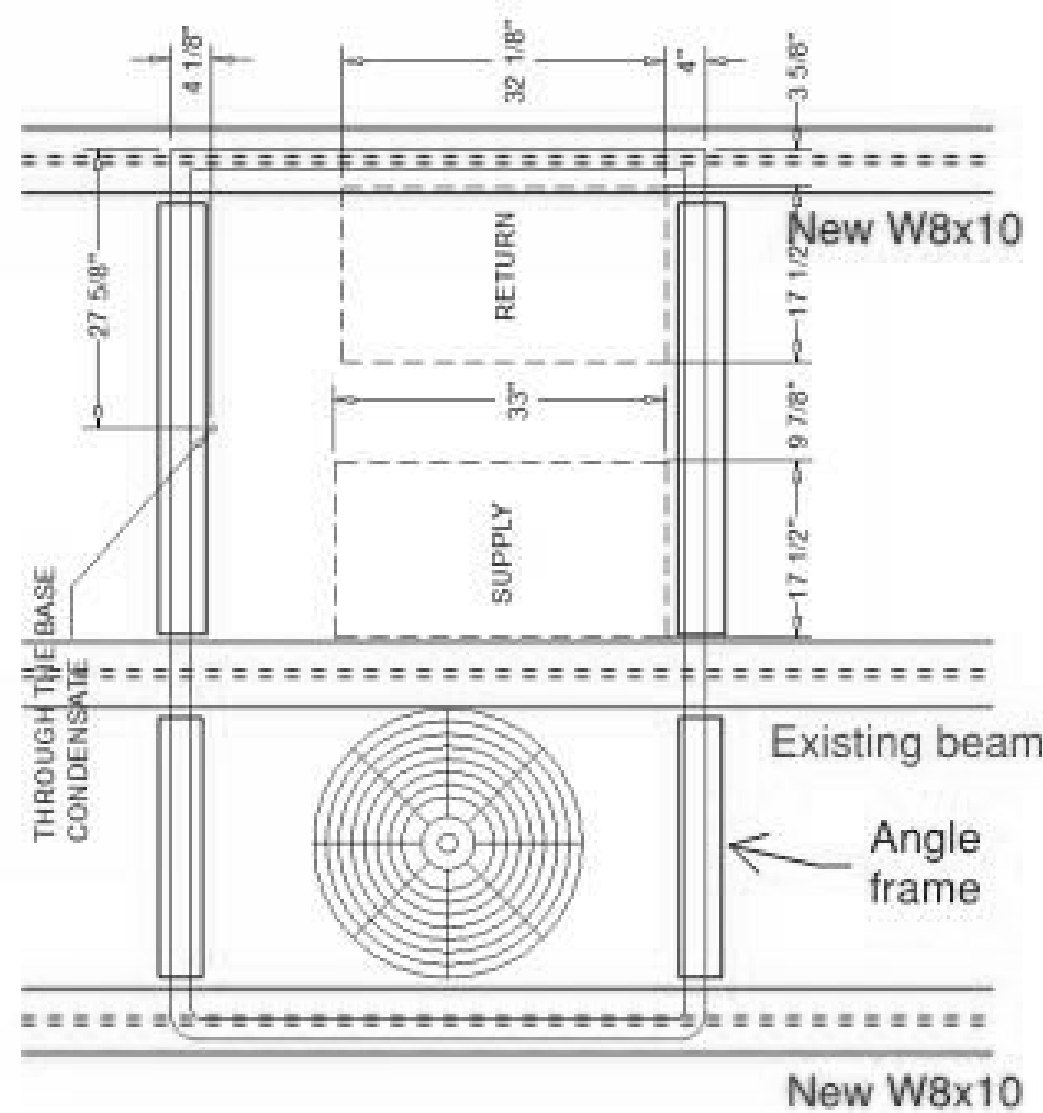
MECHANICAL DUCTWORK
FLOOR PLAN

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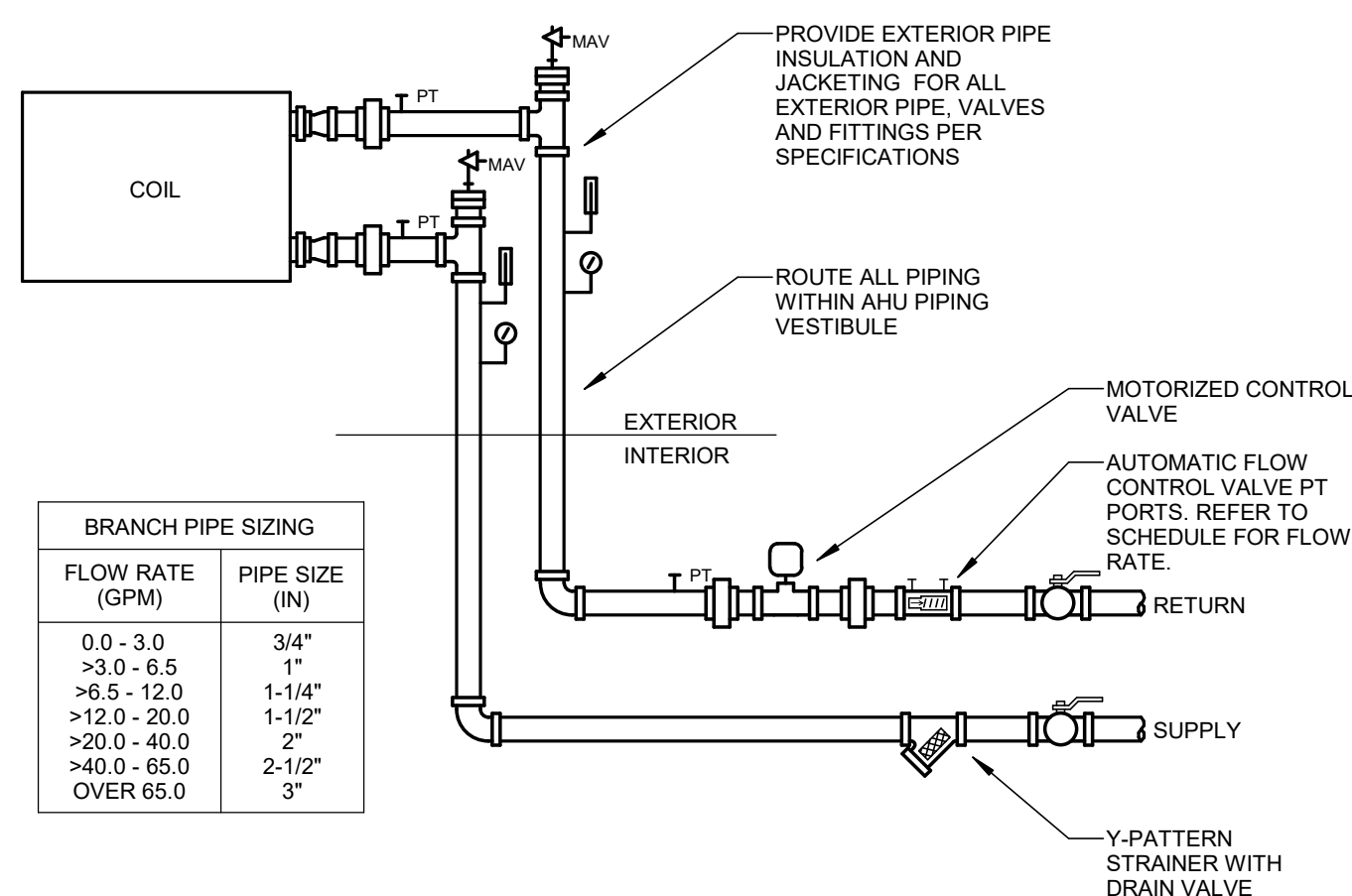
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6 STRUCTURAL FRAMING OF DUCT OPENINGS DETAILS
NTS

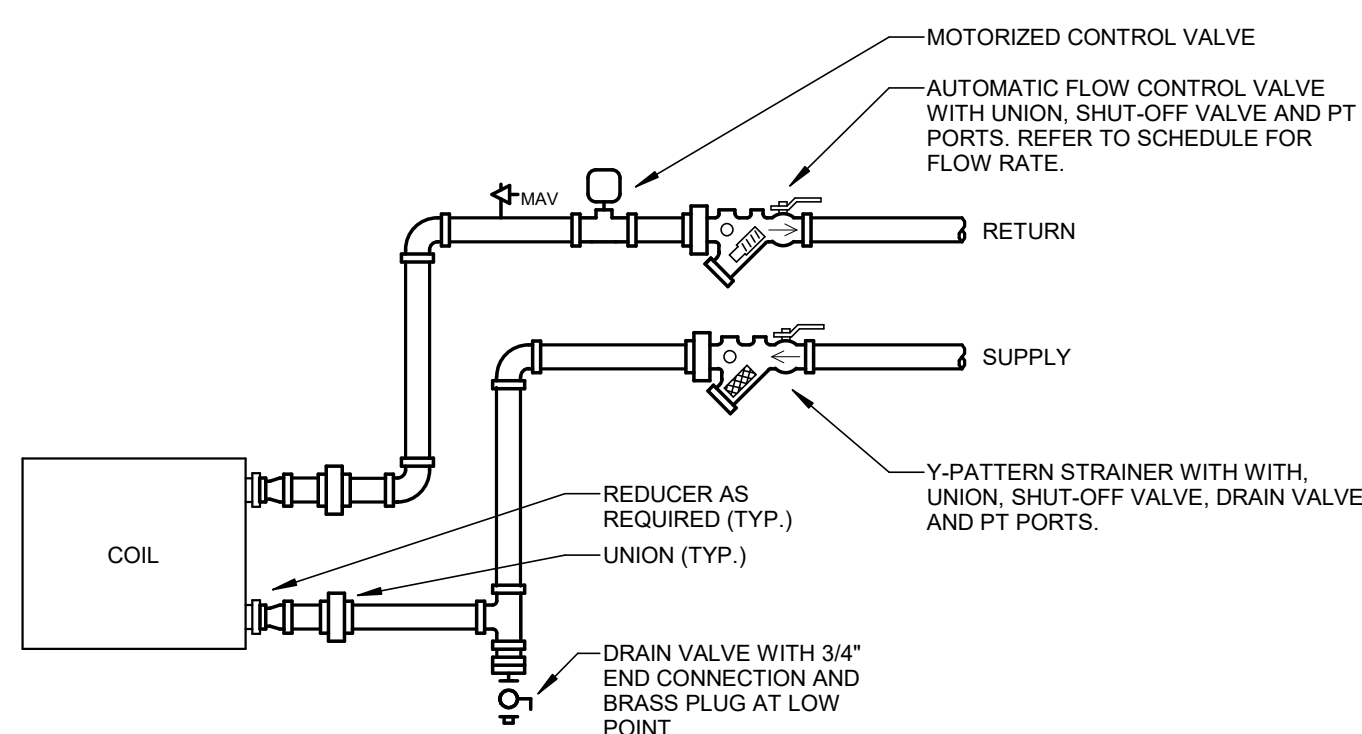


7 FRAMING OF RTU DETAIL
NTS



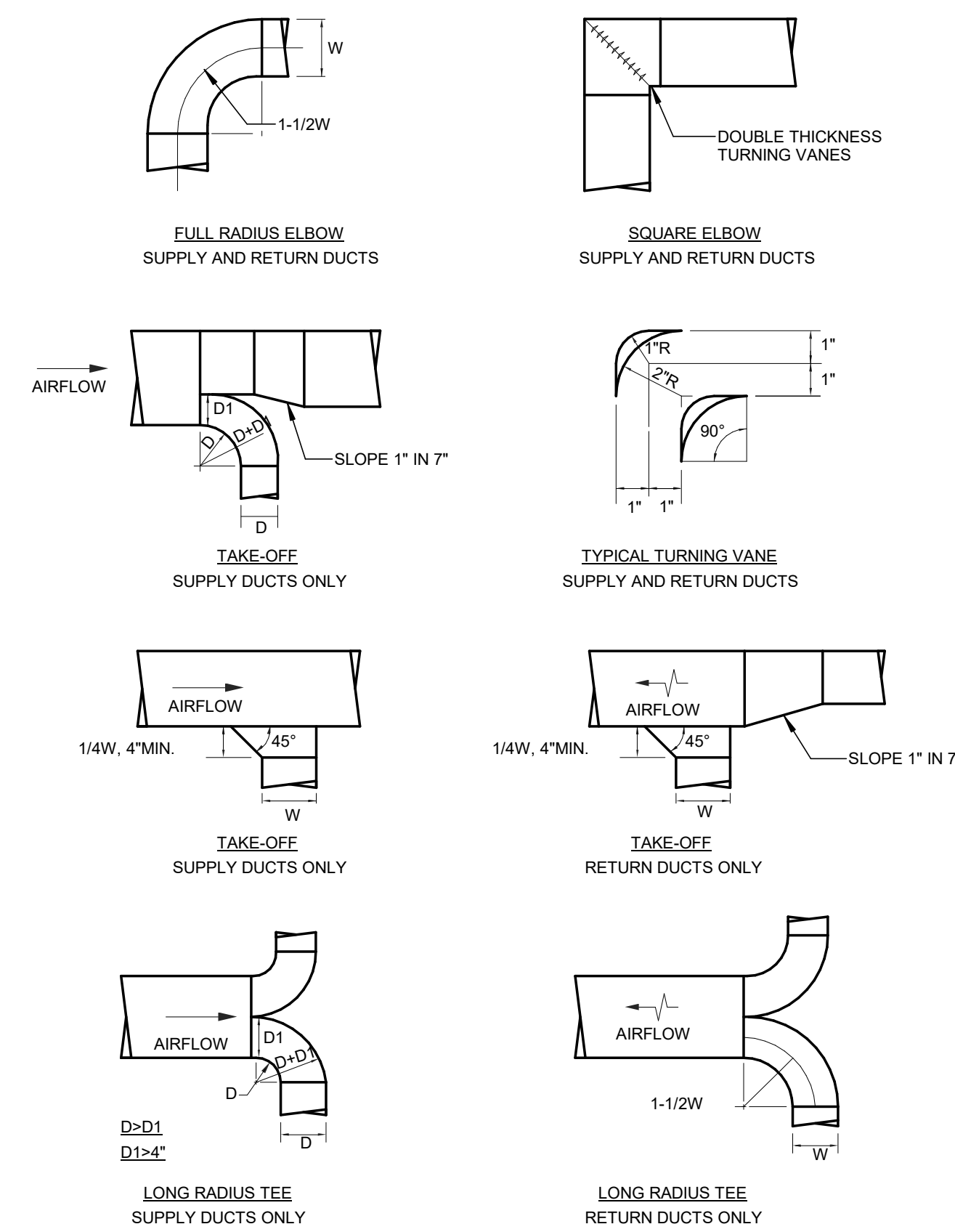
BRANCH PIPE SIZING	
FLOW RATE (GPM)	PIPE SIZE (IN)
0.0 - 3.0	3/4"
>3.0 - 6.5	1"
>6.5 - 12.0	1-1/4"
>12.0 - 20.0	1-1/2"
>20.0 - 40.0	2"
>40.0 - 65.0	2-1/2"
OVER 65.0	3"

4 COIL HOOKUP - RTU SINGLE COIL
NTS

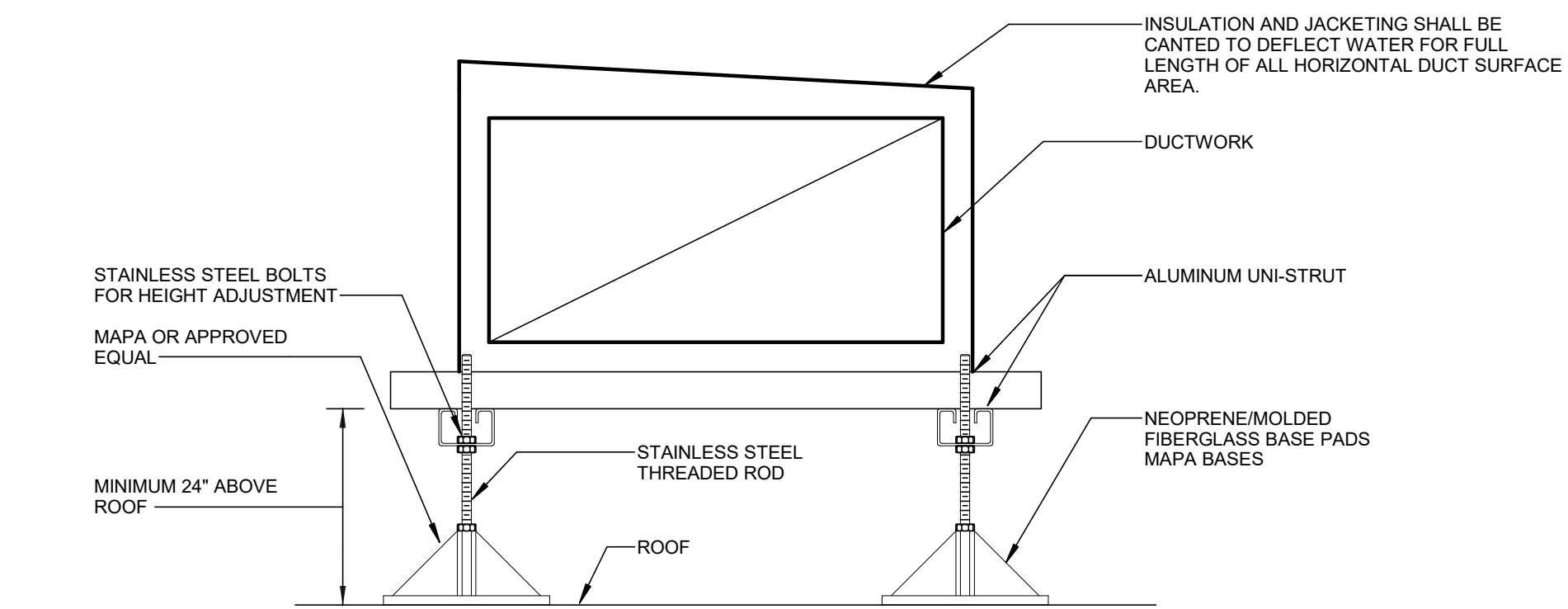


BRANCH PIPE SIZING	
FLOW RATE (GPM)	PIPE SIZE (IN)
0.0 - 3.0	3/4"
>3.0 - 6.5	1"
>6.5 - 12.0	1-1/4"
>12.0 - 20.0	1-1/2"
>20.0 - 40.0	2"
>40.0 - 65.0	2-1/2"
OVER 65.0	3"

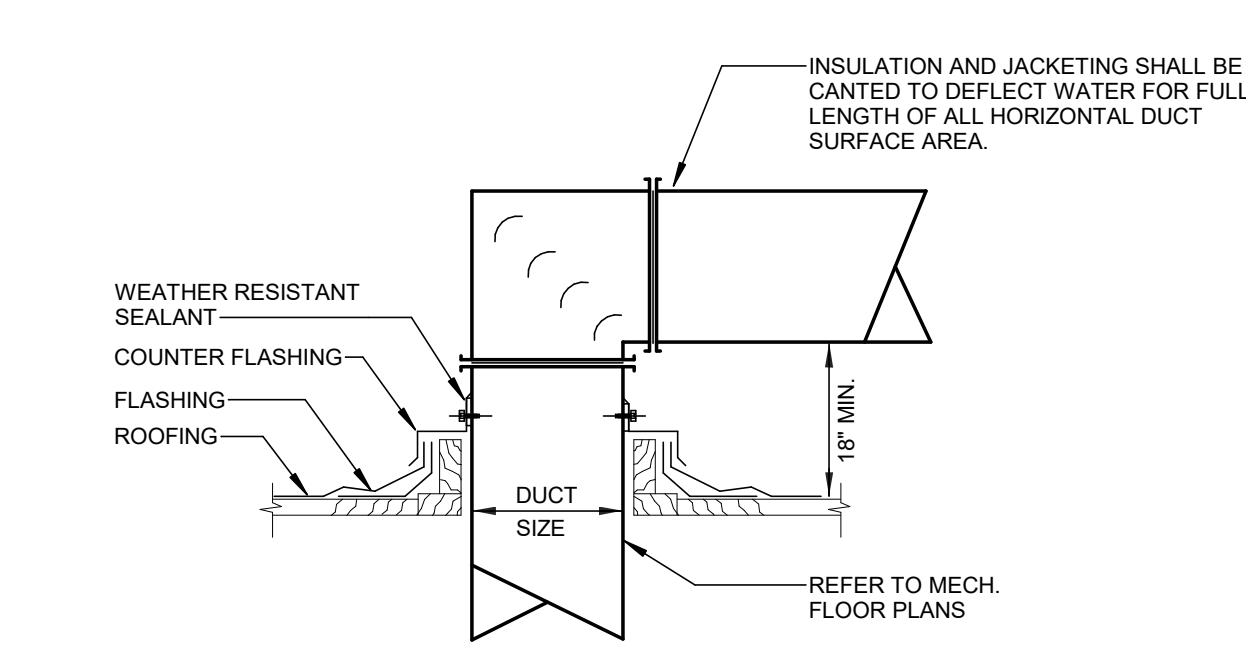
5 COIL HOOKUP - TERMINAL UNIT COIL PIPING 2-WAY
NTS



1 TYPICAL DUCT DETAILS
NTS



2 ROOF MOUNTED DUCT SUPPORT DETAIL
NTS



3 EXTERIOR DUCT ROOF PENETRATION DETAIL
NTS



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TOWN OF CHESHIRE
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PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"
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SHEET TITLE:

MECHANICAL DETAILS

SHEET NUMBER:
M5.00

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE															
GENERAL					PHYSICAL		PERFORMANCE				REMARKS			DUCTWORK	
SYMBOL	MANUFACTURER	MODEL	LOCATION	AIR HANDLER(S)	COOLING AIR DAMPER	COOLING AIR DAMPER		TYPE	RATINGS	FEATURES	INSTALL	UPSTREAM OF OUTSIDE AIR DAMPER	UPSTREAM OF COOLING AIR DAMPER		
						MAX. CFM	MIN. CFM								
VAV-A	TRANE	VCWF-12	MTD HIGH IN CLASSROOM	RTU-1 & 2	12"	1200	600	2	ALL	ALL	ALL	-	12"		

VAV TERMINAL UNIT SOUND POWER LEVEL SCHEDULE													
INLET (IN.)	CFM	DISCHARGE SOUND POWER - OCTAVE BAND (HERTZ)						RADIATED SOUND POWER - OCTAVE BAND (HERTZ)					
		125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
12	1,600	61	55	49	45	49	52	47	42	34	31	37	35

TERMINAL UNITS SHALL PRODUCE THE NOMINAL SOUND POWER LEVELS (dB re: 10E-12 WATTS) INDICATED ABOVE, MEASURED IN ACCORDANCE TO ARI STANDARD 880, AT 1.5 IN WG INLET PRESSURE

VAV TERMINAL UNIT HEATING COIL SCHEDULE													
INLET (IN.)	GPM	MAX. WPD (FT WG)	EAT (°F)	EWT (°F)	LWT (°F)	HIGH CFM		LOW CFM		HEATING			
						CFM	LAT (°F)	CFM	LAT (°F)	HIGH MBH	LOW MBH		
12	1.2	0.8	55	180	180	600	-	275	112	-	13.4		

VAV TERMINAL UNITS SHALL HAVE HOT WATER HEATING COILS. HEATING COILS SHALL BE SINGLE ROW AND SHALL HAVE A NOMINAL CAPACITY IN ACCORDANCE WITH THE ABOVE. ALL HEATING COILS LISTED ABOVE HAVE 1" HW COIL CONNECTION.

VAV DUCT SILENCER SCHEDULE																								
GENERAL					PHYSICAL												REMARKS							
TAG	MANUFACTURER	MODEL	LOCATION	SERVICE	ROUND DIAMETER 'D' (IN)	RECTANGULAR			LENGTH 'L' (IN)	AIRFLOW				DYNAMIC INSERTION LOSS (dB) BY OCTAVE BAND (Hz)				TYPE	RATINGS	FEATURES				
						WIDTH 'W' (IN)	HEIGHT 'H' (IN)	CFM		AREA (SQ. FT)	FPM	DIRECTION	APD (IN WG)	63	125	250	500				1000	2000	4000	8000
SA-VAV	VIBRO-ACOUSTICS	RD-MHV-F7	VAV-A	VAV-A	-	17"	14"	36"	1,200	-	726	+	-	3	4	11	19	22	17	12	8	1	1	ALL

REMARKS - TYPE	
1.	RECTANGULAR, GLASS FIBER MEDIA, DISSIPATIVE

REMARKS - RATINGS	
1.	AIR PRESSURE DROP (APD) AND ACOUSTICAL DATA ARE IN ACCORDANCE TO ASTM E477

REMARKS - FEATURES	
1.	ACOUSTIC MEDIA SHALL COMPLY WITH UL 181 AND ASHRAE 90A. SHALL BE 100% NATURAL COTTON FIBERS TREATED WITH AN EPA RATED NON-TOXIC BORATE SOLUTION. FLASH DRIED TO PROVIDE RESISTANCE TO MOLD, MILDEW, AND FUNGI. SHALL BE PACKED TO A MINIMUM COMPRESSION OF 15% DURING SILENCER ASSEMBLY, AND SHALL NOT CAUSE OR ACCELERATE CORROSION OF ALUMINUM OR STEEL. GLASS FIBER AND ROCK WOOL ARE NOT ACCEPTABLE SUBSTITUTES FOR THE ACOUSTIC MEDIA.
2.	ADJUST DIMENSIONS 'A' & 'B' SUCH THAT 'A' + 'B' = 'L', AND SUCH THAT THE SILENCER FITS AS INTENDED. 'A' & 'B' NEED NOT BE THE SAME LENGTH

DIFFUSER AND REGISTER SCHEDULE								
SYMBOL	MANUFACTURER/ MODEL NUMBER	DUTY	TYPE	BORDER TYPE	CONSTRUCTION			REMARKS
					OBJ	FRAME	BLADES	
A	KRUEGER AF 80	SUPPLY	DD	LAY IN	NONE	STEEL	STEEL	
B	KRUEGER S80	RETURN	LF	LAY IN	NONE	STEEL	STEEL	

TYPES:
 DD - DIRECTIONAL DIFFUSER
 LB - LINEAR BAR
 LF - LOUVERED FACE
 LS - LINEAR SLOT
 SW - SIDEWALL REGISTER
 PERF - PERFORATED / EGG-CRATE

INDICATES UNIT TYPE

REMARKS:
1. MECHANICAL CONTRACTOR SHALL COORDINATE FINISH TYPE & COLOR WITH ARCHITECT.

PACKAGED ROOFTOP AC UNIT SCHEDULE																																										
GENERAL			PHYSICAL		OUTSIDE AIR		SUPPLY FAN				DX COOLING COIL				INDIRECT GAS FURNACE				AIR-COOLED CONDENSER						ELECTRICAL				REMARKS													
TAG	MANUFACTURER	MODEL	WEIGHT (LBS)	L x W x H (IN.)	CFM	%	CFM	ESP (IN WG)	SPEED OR RPM	BHP	HP	TOTAL MBH	SENS. MBH	AIR DATA				GAS	INLET PRESS. (IN WG.)	INPUT (MBH)	OUTPUT (MBH)	PERFORMANCE DATA				# OF BURNERS	PHYSICAL						MCA	MOP	VOLTAGE	PHASE	TYPE	RATINGS	FEATURES	INSTALL		
														EAT (°F)		LAT (°F)						EAT (°F)	LAT (°F)	AFUE (%)	TURN-DOWN (%)		# OF COMP.	# OF REFRIG. CIRCUITS	STEPS OF UNLOAD	NOMINAL TONS	AMBIENT TEMP. (°F)	EER									IEER	SOUND POWER (dBA)
														DB	WB	DB	WB																									
RTU-1	TRANE	YHC120	1,700	99 x 63 x 50	1,200	30	4,000	1.5	1573	2.72	3.0	112	86	77	66	57	56	NG	7	200	160	58	98	90	MOD	1	2	2	-	10	95	12.4	14.7	-	48	60	208	3	ALL	ALL	ALL	ALL
RTU-2	TRANE	YHD210	2,600	122 x 84 x 66	2,400	30	7,000	1.5	887	4.47	5.0	212	168	77	66	57	56	NG	7	350	200	58	98	90	MOD	1	2	2	-	20	95	11.8	14.7	-	85	110	208	3	ALL	ALL	ALL	ALL

REMARKS - TYPE	
1.	DX COOLING
2.	CONVERTIBLE, DIRECT DRIVE VARIABLE SPEED EVAPORATOR FAN, SINGLE STAGE CENTRIFUGAL COMPRESSOR, MODULATING WITH 5:1 TURNDOWN NATURAL GAS FIRED FURNACE, R-410A, STAINLESS STEEL HEAT EXCHANGER.
3.	HORIZONTAL FLOW
4.	DIFFERENTIAL PRESSURE SENSOR MOUNTED IN UNIT.
5.	PACKAGED CONTROLS.
6.	MERV 13 FILTERS

REMARKS - RATINGS	
1.	COOLING CAPACITIES ARE NET CAPACITIES AT ARI 210/240 RATING CONDITIONS - 95°F OAT, 80°F EDB, & 67°F EWB

REMARKS - FEATURES	
1.	MODULATING NATURAL GAS FIRED FURNACE
2.	14" HIGH FULL PERIMETER 2" VIBRATION ISOLATION ROOF CURB
3.	VARIABLE SPEED DIRECT DRIVE INDOOR FAN
4.	BAROMETRIC RELIEF WITH COMPARTIVE ENTHALPY ECONOMIZER.
5.	FROSTSTAT
6.	RETURN AIR CO2 DEMAND CONTROL VENTILATION.

REMARKS - INSTALL	
1.	14" HIGH FULL PERIMETER, SPRING VIBRATION ISOLATION CURB SIMILAR TO MASON INDUSTRIES TYPE RSC - 2" DEFLECTION SPRINGS.

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STATUS:
ISSUED FOR BIDDING

REVISIONS:		
MARK	DATE	DESCRIPTION
Δ	.	.

TOWN OF CHESHIRE
 CHESHIRE HIGH SCHOOL
 HVAC IMPROVEMENTS
 525 South Main Street
 Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10

PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21\2021245.00 - CHESHIRE HIGH SCHOOL - HVAC\ARCH\TITLE.BLOCK

AUTHOR: DH/AC
DRAFTER: DH/AC
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

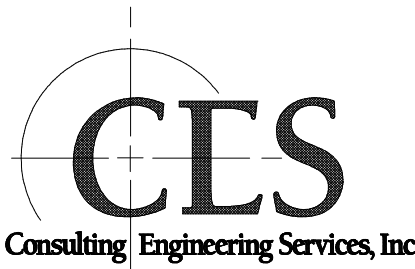
MECHANICAL SCHEDULES AND DIAGRAMS

SHEET NUMBER:

M6.00



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STATUS:
ISSUED FOR BIDDING

REVISIONS:

MARK	DATE	DESCRIPTION
Δ	*	*

TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS

525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROD\PRODUCTION\PROJ-21\2021248-00 - CHESHIRE HIGH SCHOOL - HVAC\ARCH\TITLE BLOCK

AUTHOR: Author
DRAFTER: Author
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

MECHANICAL DRAWING
SPECIFICATIONS

SHEET NUMBER:

M7.00

23 00 00 - GENERAL

A. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC., AND COORDINATE WITH OTHER TRADES INVOLVED. THE WORK REQUIREMENTS DESCRIBED WITHIN DIVISION 20 SPECIFICATION SECTION "COMMON MECHANICAL / ELECTRICAL REQUIREMENTS" FORM COMPLIMENTARY REQUIREMENTS TO THE SCOPE OF WORK CONTAINED WITHIN DIVISION 23.

B. DESCRIPTION

- THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT SHALL PROCEED IN A MANNER THAT MINIMIZES ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
- SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.

C. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT

- FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS"
- INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
- PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
- REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
- SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND/OR METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT."

D. DRAWINGS

- DRAWINGS ARE DIAGRAMMATIC. THE FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS, THOUGH SOME OFFSETS & TRANSITIONS MAY BE SHOWN IN PIPING & SHEET METAL TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM. IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING & SHEET METAL OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE WORK AND PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.

E. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING:

- SHEET METAL SMACNA STANDARDS
- INTERNATIONAL MECHANICAL CODE
- INTERNATIONAL ENERGY CONSERVATION CODE
- INTERNATIONAL EXISTING BUILDING CODE
- ALL OTHER APPLICABLE STATE AND LOCAL CODES AND ORDINANCES/OWNER STANDARDS AND BASE BUILDING SPECIFICATIONS AND STANDARDS.

F. PERMITS AND FEES:

- THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND STATE TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK. FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION. OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

G. EXISTING SYSTEMS AND EQUIPMENT

- EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.
- CONNECT WORK TO VARIOUS EXISTING SYSTEMS AS INDICATED ON THE DRAWINGS. WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEM CONDITIONS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED AS WELL AS WITH EXISTING SYSTEMS, THE STRUCTURE, AND OTHER OBSTRUCTIONS.
- PROVIDE THE FOLLOWING SERVICES ON ALL EXISTING HVAC EQUIPMENT INDICATED TO REMAIN:
 - CLEAN CONDENSATE PAN AND TRAP
 - CALIBRATE CONTROLS
 - FILTER CHANGES
 - VERIFY FAN ROTATION AND OPERATION
 - BALANCING
 - VERIFY PITCH OF CONDENSATE DRAIN PIPES AND DRAIN PAN
 - VERIFY EQUIPMENT CONTROL OPERATION
 - LUBRICATION OF FANS, MOTORS, ETC.
 - CLEAN HEATING/COOLING COILS
- SURVEY AND MEASUREMENTS
 - THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, SHALL BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS.
 - DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GVERN ALL DIMENSIONS.
 - PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
 - CONTRACTORS SHALL VERIFY LAYOUT AND BE RESPONSIBLE FOR ALL MEASUREMENTS OF ALL EXISTING CONDITIONS BEFORE COMMENCING WORK AND SHALL NOTIFY ARCHITECT AND/OR ENGINEER IF A CONDITION EXISTS THAT PREVENTS THE CONTRACTOR FROM ACCOMPLISHING THE INTENT OF THE DRAWINGS.

I. SUBMITTALS AND SHOP DRAWINGS

- SUBMIT FOR REVIEW, ELECTRONIC SHOP DRAWINGS IN SEARCHABLE PDF FORMAT FOR THE FOLLOWING.
 - SUBMITTAL DATA FOR ALL MATERIAL AND EQUIPMENT. CLEARLY IDENTIFY DEVIATIONS OF THE SUBMITTED PRODUCTS FROM THE DESIGN.
 - DUCTWORK AND PIPING SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"-10". HIGHLIGHT, ENIRCLE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS FOR SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS.
 - CONTROLS SHOP DRAWINGS: INCLUDE EQUIPMENT AND SYSTEM CONTROL SCHEMATICS, SEQUENCES OF OPERATIONS, LOGIC DIAGRAMS AND SYSTEM COMPONENTS INCLUDING DETAILS OF TIE-IN TO EXISTING BUILDING CONTROL MANAGEMENT SYSTEM.
- DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
- DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SUBMITTALS.
- SCHEDULE AT LEAST TEN WORKING DAYS EXCLUSIVE OF TRANSMITTAL TIME, FOR SUBMITTAL REVIEW.

J. AS-BUILT DRAWINGS

- MAINTAIN ONE SET OF PRINTS ON THE SITE AND NOTE ALL CHANGES OR DEVIATIONS FROM THE ORIGINAL DESIGN THEREON. AT THE COMPLETION OF THE PROJECT, INCORPORATE ALL CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.

K. OPERATION AND MAINTENANCE

- UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.
- THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
- OPERATION AND MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING:
 - MANUFACTURER'S PRINTED OPERATING AND MAINTENANCE PROCEDURES.
 - MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING.
 - COPIES OF WARRANTIES.
 - APPROVED SHOP DRAWINGS AND PRODUCT DATA.
 - BALANCE REPORTS.
 - INCLUDE IN THE MANUAL, A TABULATED EQUIPMENT SCHEDULE FOR ALL EQUIPMENT. SCHEDULE SHALL INCLUDE PERTINENT DATA SUCH AS: MAKE, MODEL NUMBER, SERIAL NUMBER, VOLTAGE, NORMAL OPERATING CURRENT, BELT SIZE, FILTER QUANTITIES AND SIZES, BEARING NUMBER, ETC. SCHEDULE SHALL INCLUDE MAINTENANCE TO BE DONE AND FREQUENCY.
- MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.

L. CLEANING

- ALL WORK AREAS SHALL BE LEFT AS CLEAN AS NEW. CLEAN INTERNALS OF ALL DUCTWORK AND AIR HANDLING UNITS AND REPLACE FILTERS AFTERWARDS.
- DUCTWORK: DUCTS SHALL BE THOROUGHLY CLEANED SO THAT NO DIRT OR DUST SHALL BE DISCHARGED FROM DIFFUSERS, REGISTERS, OR GRILLES, WHEN SYSTEM IS OPERATED.
- PIPING: AFTER CONDENSATE PIPING HAS BEEN PRESSURE TESTED AND APPROVED FOR TIGHTNESS, CLEAN AND FLUSH PIPING.
- EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.
- WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.

M. GUARANTEE

- GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.

N. MEANS AND METHODS ALL TRADES

- INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
- MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
- CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
- SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
- EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS
- WATERPROOFING: WHERE ANY WORK PIERCES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL AND FLOORS IN WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.
- PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRESTOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814.
- PROVIDE ACCESS PANELS IN WALLS, FLOORS AND GYPSUM WALL BOARD CEILINGS TO ALLOW ACCESS TO DAMPERS, HEATERS, VALVES, VARIABLE AIR VOLUME BOXES, FAN BOXES AND OTHER APPARATUS AND EQUIPMENT REQUIRING PERIODIC SERVICE AND INSPECTION. NOT ALL ACCESS PANELS ARE INDICATED ON THE PLANS. REVIEW ARCHITECTURAL AND MECHANICAL PLANS TO DETERMINE THE LOCATION AND QUANTITY OF ACCESS PANELS REQUIRED. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.

23 05 05 - DEMOLITION

- REFER TO DRAWINGS FOR GENERAL DESCRIPTION OF AREAS REQUIRING DEMOLITION.
- ANY DEMOLITION SHALL BE COORDINATED WITH OWNER, ARCHITECT, G.C. AND ENGINEER
- REFER TO GENERAL CONTRACTOR'S/CONSTRUCTION MANAGER'S INSTRUCTIONS FOR EXISTING EQUIPMENT AND MATERIALS THAT SHALL REMAIN THE PROPERTY OF THE OWNER.
- WHERE IT IS NOTED THAT ITEMS OF VALUE ARE NOT TO BE RETURNED TO THE OWNER, THE ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. STORAGE OR SALE OF ITEMS ON THE PROJECT SITE IS PROHIBITED. ITEMS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF.
- PROTECTION: ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING/SITE DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGE TO THE CONDITION BEFORE BEING DAMAGED TO THE SATISFACTION OF THE ARCHITECT AND OWNER. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.
- UTILITIES:

- MAINTAIN UTILITIES EXCEPT THOSE REQUIRING REMOVAL OR RELOCATION. KEEP UTILITIES IN SERVICE AND PROTECT FROM DAMAGE. DO NOT INTERRUPT UTILITIES SERVING IN-USE AREAS WITHOUT FIRST OBTAINING PERMISSION FROM THE UTILITY COMPANY AND THE OWNER.
- COORDINATE ALL INTERRUPTIONS OF SERVICES AND LIMITATIONS OF ACCESS WITH THE OWNER NO LESS THAN 5 DAYS PRIOR TO THE INTERRUPTION.
- PROVIDE TEMPORARY SERVICES AS REQUIRED. SHUTDOWN OF EXISTING SYSTEMS FOR CONNECTION OF NEW WORK SHALL BE COORDINATED IN ADVANCE WITH THE CONSTRUCTION MANAGER AND BUILDING OWNER.

G. DISCONNECT, DEMOLISH, AND REMOVE HVAC SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED. PIPING TO BE REMOVED. REMOVE PORTION OF PIPING INDICATED TO BE REMOVED AND CAP REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.

- PIPING TO BE ABANDONED IN PLACE: DRAIN PIPING AND CAP PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
- DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND CAP REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.
- DUCTS TO BE ABANDONED IN PLACE: CAP DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.
- EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
- EQUIPMENT TO BE REMOVED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT; WHEN APPROPRIATE, REINSTALL, RECONNECT, AND MAKE EQUIPMENT OPERATIONAL.
- EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER.

H. IF PIPE, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.

23 05 17 - SLEEVES AND PENETRATIONS

A. GENERAL REQUIREMENTS

- LAY OUT PENETRATION AND SLEEVE OPENINGS IN ADVANCE. COORDINATE WORK CAREFULLY WITH ARCHITECTURAL AND STRUCTURAL WORK. PROVIDE CORE DRILLING OF EXISTING CONSTRUCTION WHERE REQUIRED. SUBMIT PROPOSED LOCATIONS FOR REVIEW PRIOR TO CORE DRILLING.
 - MAINTAIN FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PENETRATIONS. SEAL PENETRATIONS WITH APPROVED FIRESTOP MATERIALS.
 - SLEEVES FOR INSULATED PIPE AND DUCT IN NON-FIRE RATED CONSTRUCTION SHALL ACCOMMODATE CONTINUOUS INSULATION WITHOUT COMPRESSION.
- B. PIPE SLEEVES:**
- PROVIDE HOT-DIPPED GALVANIZED SCHEDULE 40 STEEL PIPE SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS AND CONCRETE FLOOR AND ROOF SLABS.
 - PROVIDE 26 GAUGE GALVANIZED STEEL SLEEVES THROUGH PARTITIONS AND NON-FIRE-RATED CONSTRUCTION.
 - PROVIDE MECHANICAL SLEEVE SEALS CONSISTING OF INTERLOCKING MODULES AT EXTERIOR PIPE PENETRATIONS.
 - PROVIDE ADJUSTABLE ESCUTCHEONS ON EXPOSED PIPING THAT PASSES THROUGH FINISHED FLOORS, WALLS AND CEILINGS. ESCUTCHEONS SHALL BE CHROMIUM-PLATED CAST BRASS, SIZED TO COVER SLEEVE OPENING AND TO ACCOMMODATE PIPE AND INSULATION.

C. DUCT SLEEVES AND OPENINGS:

- PROVIDE GALVANIZED-STEEL SHEET DUCT SLEEVES FOR ROUND DUCTS 15 INCHES AND SMALLER. PROVIDE PREPARED, FRAMED OPENINGS FOR ROUND DUCTS LARGER THAN 15 INCHES AND FOR SQUARE, RECTANGULAR AND FLAT OVAL DUCTS, EXCEPT AS SPECIFIED OTHERWISE. SLEEVES SHALL MEET SMACNA REQUIREMENTS.
- PROVIDE GALVANIZED-STEEL SHEET DUCT SLEEVES FOR SLEEVES THROUGH FIRE-RATED CONSTRUCTION AND THROUGH SMOKE PARTITIONS. SLEEVE AND SEAL MATERIALS, CONSTRUCTION AND CLEARANCES SHALL MEET REQUIREMENTS OF SMACNA FIRE DAMPER AND HEAT STOP GUIDE FOR AIR HANDLING SYSTEMS. WHERE FIRE DAMPERS ARE REQUIRED, INSTALL SLEEVE AND DAMPER ASSEMBLY IN ACCORDANCE WITH DAMPER LISTING.

23 05 29 - HANGERS AND SUPPORTS

- PROVIDE PIPE STANDS, SUPPORTS, HANGERS AND OTHER SUPPORTING APPLIANCES AS NECESSARY TO SUPPORT WORK REQUIRED BY CONTRACT DOCUMENTS. SPACING OF HANGERS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE BUILDING AND MECHANICAL CODES. STRUCTURAL STEEL SUPPORTS, HANGERS, ETC. SHALL BE ANGLE IRON, STEEL CHANNEL OR STEEL ROD USED WITH APPROVED CLAMPS, INSERTS, ETC. ALL SUPPORTS, HANGERS, BRACKETS, ETC., SHALL BE AS APPROVED BY THE ENGINEER.
- ALL HANGERS SHALL BE GALVANIZED.
- ATTACH HANGERS AND SUPPORTS DIRECTLY ONTO THE STRUCTURE BY FIRST REMOVING EXISTING FIRE PROOFING AND AFTER SECURING THE ATTACHMENT, REPAIRING THE FIRE PROOFING TO ITS ORIGINAL CONDITION, CONTINUOUSLY OVER THE ATTACHMENT.
- FOR EXPANSION BOLTS/SHELDIS USE RED HEAD, H/LTI OR WEL-TI SELF DRILLING OR STEEL SHIELD, LOAD RATED. DO NOT USE DRILLED ANCHORS IN POST TENSION SLABS WITHOUT APPROVAL OF OWNER. DO NOT CUT REINFORCING STEEL WITH DRILLED INSERTS.
- SUPPORT ALL GALVANIZED DUCTWORK WITH GALVANIZED HANGERS AND MOUNTS AS REQUIRED BY SMACNA (8 FT SPACING). DO NOT SUPPORT RISERS FROM SLEEVES IN SLABS.

23 05 48 - VIBRATION AND SEISMIC CONTROLS FOR HVAC

- PROVIDE VIBRATION ISOLATION FOR EACH PIECE OF ROTATING OR RECIPROCATING HVAC EQUIPMENT SHOWN ON THE DRAWINGS. ALL ISOLATION COMPONENTS SHALL BE SUPPLIED BY A SINGLE MANUFACTURER - MASON INDUSTRIES, KINETICS OR AMBER BOOTH. TYPES OF ISOLATORS, REQUIRED DEFLECTIONS, AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.
- PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE. FOR EACH SEISMIC RESTRAINT, PROVIDE CERTIFIED CALCULATIONS TO VERIFY ADEQUACY TO MEET THE FOLLOWING DESIGN REQUIREMENTS: ABILITY TO ACCOMMODATE RELATIVE SEISMIC DISPLACEMENTS OF SUPPORTED ITEM BETWEEN POINTS OF SUPPORT. ABILITY TO ACCOMMODATE THE REQUIRED SEISMIC DEFLECTIONS. FOR EACH RESPECTIVE SET OF ANCHOR BOLTS PROVIDE CALCULATIONS TO VERIFY ADEQUACY TO MEET COMBINED SEISMIC-INDUCED SHEAR AND TENSION FORCES. FOR EACH WELDMET BETWEEN STRUCTURE AND ITEM SUBJECT TO SEISMIC FORCE, PROVIDE CALCULATIONS TO VERIFY ADEQUACY. CALCULATIONS SHALL BE STAMPED BY A PROFESSIONAL ENGINEER WHO IS REGISTERED IN THE STATE WHERE THE WORK IS BEING PERFORMED AND HAS SPECIFIC EXPERIENCE IN SEISMIC CALCULATIONS. RESTRAINTS SHALL MAINTAIN THE RESTRAINED ITEM IN A CAPTIVE POSITION WITHOUT SHORT CIRCUITING THE VIBRATION ISOLATION.

23 05 53 - PIPE AND DUCT IDENTIFICATION

- DUCTWORK AND PIPING SHALL BE LABELED WITH PREPRINTED SELF-ADHESIVE, PREMIUM GRADE VINYL, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION.
- VALVES SHALL BE TAGGED WITH STAMPED OR ENGRAVED BRASS VALVE TAGS. INSTALL TAGS ON VALVES AND CONTROL DEVICES IN PIPING SYSTEMS, EXCEPT CHECK VALVES. VALVES WITHIN FACTORY-FABRICATED EQUIPMENT UNITS; SHUTOFF VALVES; FALCETS; CONVENIENCE AND LAWN-WATERING HOSE CONNECTIONS; AND HVAC TERMINAL DEVICES AND SIMILAR ROUGHING-IN CONNECTIONS OF END-USE FIXTURES AND UNITS. LIST TAGGED VALVES IN A VALVE SCHEDULE.
- MACHINERY SUCH AS RTUS, FANS, ETC. SHALL BE LABELED WITH PLASTIC LABELS WITH ENGRAVED EQUIPMENT NUMBER CORRESPONDING TO DRAWING SCHEDULE NUMBERS.

23 05 93 - TESTING ADJUSTING AND BALANCING

- PROVIDE QUALIFIED PERSONNEL, EQUIPMENT, APPARATUS AND SERVICES FOR START-UP, TESTING AND BALANCING OF MECHANICAL SYSTEMS, TO PERFORMANCE DATA SHOWN IN SCHEDULES, AS SPECIFIED, AND AS REQUIRED BY CODES, STANDARDS, REGULATIONS AND AUTHORITIES HAVING JURISDICTION INCLUDING CITY INSPECTORS, OWNERS AND ARCHITECT
- PROVIDE THE SERVICES OF AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING (TAB) AGENCY TO PROVIDE TAB SERVICES FOR THE MECHANICAL SYSTEMS. THE TAB AGENCY SHALL BE CERTIFIED BY NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR THE ASSOCIATED AIR BALANCE COUNCIL (AABC) IN THOSE TESTING AND BALANCING DISCIPLINES REQUIRED FOR THIS PROJECT. THE TAB AGENCY SHALL HAVE AT LEAST ONE PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SERVICES ARE TO BE PERFORMED AND CERTIFIED BY NEBB OR AABC AS A TEST AND BALANCE ENGINEER.
- PRIOR TO TESTING, ADJUSTING, AND BALANCING, THE MECHANICAL CONTRACTOR SHALL VERIFY THAT THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING AS SPECIFIED. APPROVED SHOP DRAWINGS, AS BUILT DRAWINGS, AND ALL OTHER DATA REQUIRED FOR EACH SYSTEM AND/OR COMPONENT TO BE TESTED SHALL BE MADE AVAILABLE AT THE JOB SITE DURING THE ENTIRE TAB EFFORT. THE OWNER SHALL BE NOTIFIED IN WRITING OF ALL EQUIPMENT, COMPONENTS, OR BALANCING DEVICES, THAT ARE DAMAGED, INCORRECTLY INSTALLED, OR MISSING, AS WELL AS ANY DESIGN DEFICIENCIES THAT WILL PREVENT PROPER TESTING, ADJUSTING, AND BALANCING. TESTING, ADJUSTING, AND BALANCING SHALL NOT COMMENCE UNTIL APPROVED BY THE OWNER.
- PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM IDENTIFIED, IN ACCORDANCE WITH THE DETAILED PROCEDURES OUTLINED IN EITHER NEBB, "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR AABC, "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE." THE TAB AGENCY SHALL TEST, ADJUST, AND BALANCE THE FOLLOWING MECHANICAL SYSTEMS:
 - ALL AIR HANDLING EQUIPMENT
 - ALL PUMPING SYSTEMS
 - ALL SUPPLY AIR SYSTEMS
 - ALL RETURN AIR SYSTEMS
 - ALL HYDRONIC SYSTEMS
 - VERIFY OPERATION OF ALL TEMPERATURE CONTROL SYSTEMS
 - TEST SYSTEMS FOR PROPER SOUND AND VIBRATION LEVELS
- SUBMIT TESTING, ADJUSTING, AND BALANCING REPORTS BEARING THE SEAL AND SIGNATURE OF THE TAB PROFESSIONAL ENGINEER. PREPARE A REPORT OF RECOMMENDATIONS FOR CORRECTING UNSATISFACTORY MECHANICAL PERFORMANCES WHEN A SYSTEM CANNOT BE SUCCESSFULLY BALANCED.
- START UP ALL SYSTEMS, PRESSURE TEST DUCTWORK AND PIPING, AND BALANCE SYSTEMS INCLUDING, BUT NOT LIMITED TO, ALL NEW AND EXISTING REGISTERS, GRILLES, DIFFUSERS, TERMINAL UNITS, FANS, ETC. WITHIN THE AREA OF WORK TO PERFORMANCE DATA SHOWN ON PLANS, SCHEDULES, AND AS SPECIFIED.
- DO NOT COVER OR CONCEAL WORK BEFORE TESTING AND INSPECTION AND OBTAINING APPROVAL.
- LEAKS, DAMAGE AND DEFECTS DISCOVERED OR RESULTING FROM STARTUP, TESTING, AND BALANCING SHALL BE REPAIRED OR REPLACED TO LIKE-NEW CONDITION WITH ACCEPTABLE MATERIALS. TEST SHALL BE CONTINUED UNTIL SYSTEM OPERATES WITHOUT ADJUSTMENT OR REPAIR.
- REPORT ON REPORTING FORMS, SUBMITTED TO ARCHITECT FOR APPROVAL IN ADVANCE.
- SUBMIT PROCEDURES, RECORDING FORMS, AND TEST EQUIPMENT FOR REVIEW PRIOR TO BALANCING, AS DESCRIBED IN SPECIFICATIONS. SUBMIT ELECTRONIC COPY OF TESTING AND BALANCING REPORTS TO ARCHITECT FOR APPROVAL.
- FURNISH ALL TEST MEDIUMS AND DISPOSE OF ALL TEST MEDIUMS AT AN APPROVED OFF-SITE LOCATION AFTER TESTING IS COMPLETE.
- NOTE REQUIREMENT ABOVE FOR CFM AND STATIC PRESSURE READINGS PRIOR TO DEMOLITION.
- THE BALANCING CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL DIRECTIONAL ADJUSTMENT OF ALL LINEAR DIFFUSERS AS INDICATED ON PLANS. IF NO DIRECTIONAL FLOW IS INDICATED INTERIOR LINEAR DIFFUSERS SHALL BE DIRECTED HORIZONTALLY AND PERIMETER LINEAR DIFFUSER SHALL BE DIRECTED VERTICALLY. IF PERIMETER LINEAR DIFFUSERS HAVE MULTIPLE SLOTS THE PERIMETER SLOT DIRECTED VERTICALLY, AND THE INTERIOR SLOT DIRECTED HORIZONTALLY TOWARDS THE INTERIOR SPACE.

23 07 13 - HVAC INSULATION

A. GENERAL REQUIREMENTS

- 1. INSULATION SHALL BE CERTAIN-TEED, KNAUF, MANVILLE, OR OWENS CORNING. MATERIALS SHALL MEET REQUIREMENTS OF ADHESIVE AND SEALANT COUNCIL STANDARDS AND SMACNA. INSTALL INSULATION, MASTICS, ADHESIVES, COATINGS, COVERS, WEATHERPROTECTION AND OTHER WORK IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 SMOKE DEVELOPED.
2. INSULATION AND VAPOR BARRIER SHALL BE CONTINUOUS AROUND ENTIRE PERIMETER OF DUCTS. DUCTS SUPPORTED BY METAL STRAPS SHALL HAVE INSULATION ENCOMPASSING STRAPS, WHERE STRAPS PENETRATE AT TOP OF DUCT TIGHTLY SEAL AROUND STRAP WITH INSULATING TAPE. DUCTS SUPPORTED BY TRAPEZE TYPE HANGERS UNDER DUCTS SHALL HAVE 6 LB. DENSITY RIGID INSULATION PROVIDED BETWEEN DUCT AND HANGER. INSULATION SHALL BE SAME THICKNESS AND VAPOR BARRIER AS SPECIFIED FOR SPECIFIC DUCT TYPE. RIGID INSULATION SECTION SHALL BE FULL WIDTH OF DUCT AND MINIMUM 12" LONG. TAPE AND SEAL ALL SEAMS WHERE RIGID INSULATION MEETS OTHER INSULATION.
3. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME THICKNESS AS ADJOINING PIPE INSULATION, WITH PRESENT SECTIONS.
4. FOR STRAINERS AND OTHER VALVES OR FITTINGS WHICH NEED MAINTENANCE, PROVIDE PREFORMED REMOVABLE INSULATION SECTION.

B. PRODUCTS AND APPLICATIONS

- 1. INDOOR DUCT INSULATION SHALL BE MINERAL FIBER BLANKET DUCT INSULATION WITH FACTORY APPLIED FSK JACKET. PROVIDE MINIMUM OF R-6 (AS INSTALLED) INSULATION FOR THE FOLLOWING:
a. SUPPLY AND FRESH AIR DUCTS WHEN LOCATED WITHIN CONCEALED SPACES INSIDE THE BUILDING ENVELOPE.
b. RETURN AIR DUCTWORK IN UNCONDITIONED SPACES (WHERE SPACE TEMPERATURE IS MORE THAN 10 DEGREES F DIFFERENT FROM DUCT TEMPERATURE)
2. OUTDOOR DUCT INSULATION SHALL BE RIGID MINERAL FIBER BOARD DUCT INSULATION WITH FACTORY APPLIED FSK JACKET. PROVIDE MINIMUM OF R-12 (AS INSTALLED) INSULATION FOR SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTS WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE.
3. HOT WATER PIPE INSULATION SHALL BE FIBROUS GLASS PIPE INSULATION WITH FACTORY-APPLIED ASJ WITH K FACTOR OF AT LEAST 0.23 AT 75F MEAN TEMPERATURE. PROVIDE MINIMUM 1-1/2 INCH THICKNESS. PROVIDE 2 INCH THICKNESS FOR HEATING HOT WATER PIPES 1-1/2 INCH DIAMETER AND GREATER.
4. HOT WATER PIPE PVC PLASTIC PIPE JACKET. ASTM D1785, ONE PIECE MOLDED TYPE FITTING, COVERS AND SHEET MATERIAL, WHITE COLOR, 10 MIL THICKNESS. PIPING EXPOSED TO VIEW IN FINISHED SPACES PROVIDE WITH PVC PLASTIC PIPE JACKETING FOR ADDITIONAL PROTECTION. LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.
5. CONDENSATE DRAIN LINE INSULATION SHALL BE 1 INCH THICK FLEXIBLE ELASTOMERIC, ACCEPTABLE MANUFACTURERS: ARMACELL OR K-FLEX.
6. EQUIPMENT INSULATION SHALL BE MINERAL FIBER BOARD INSULATION WITH FACTORY APPLIED ASJ. PROVIDE 2 INCH THICK FOR HEATING SYSTEM HEAT EXCHANGERS, 1 INCH THICK FOR OTHER EQUIPMENT. INSULATION SHALL BE FORMED OR FABRICATED TO FIT EQUIPMENT.
7. FIRE-RATED INSULATION SHALL BE FIRE-RATED BLANKET WITH FSK JACKET TESTED AND CERTIFIED TO PROVIDE A 1 OR 2-HOUR RATING AS REQUIRED BY ASSEMBLY. PROVIDE FIRE-RATED INSULATION FOR KITCHEN HOOD EXHAUST DUCTS AND AS INDICATED ON THE PLANS. INSTALL IN STRICT CONFORMANCE WITH MANUFACTURER'S REQUIREMENTS AND PER NFPA AND LOCAL CODE AND FIRE DEPT. ACCEPTABLE MANUFACTURERS: CERTAIN-TEED FLAMECHECK, MANVILLE FIRETEMP WRAP, UNIFRAX FYREWRAPO 3M FIRE BARRIER WRAP.

C. OUTDOOR JACKET

- a. PROVIDE OUTDOOR DUCTWORK WITH WEATHER-PROOF LAMINATE JACKETING SYSTEM, 3M VENTUREGLAD OR APPROVED EQUAL.
b. PROVIDE OUTDOOR PIPING WITH WATERPROOF 0.016" THICK ALUMINUM JACKET WITH 2" TRANSVERSE AND LONGITUDINAL LAPPED SEAMS ORIENTED TO SHED WATER.

23 08 00 - COMMISSIONING OF HVAC

- A. SCOPE OF HVAC TESTING SHALL INCLUDE ENTIRE HVAC INSTALLATION, FROM CENTRAL EQUIPMENT FOR HEAT GENERATION AND REFRIGERATION THROUGH DISTRIBUTION SYSTEMS TO EACH CONDITIONED SPACE. TESTING SHALL INCLUDE MEASURING CAPACITIES AND EFFECTIVENESS OF OPERATIONAL AND CONTROL FUNCTIONS.
B. TEST ALL OPERATING MODES, INTERLOCKS, CONTROL RESPONSES, AND RESPONSES TO ABNORMAL OR EMERGENCY CONDITIONS, AND VERIFY PROPER RESPONSE OF BUILDING AUTOMATION SYSTEM CONTROLLERS AND SENSORS.
C. THE CXA ALONG WITH THE HVAC CONTRACTOR, TESTING AND BALANCING CONTRACTOR, AND CONTROLS CONTRACTOR SHALL PREPARE DETAILED TESTING PLANS, PROCEDURES, AND CHECKLISTS FOR HVAC SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.
D. PERFORM COMMISSIONING TESTS AT THE DIRECTION OF THE CXA. PROVIDE TECHNICIANS, INSTRUMENTATION, AND TOOLS REQUIRED TO PERFORM COMMISSIONING TESTS. PROVIDE INFORMATION REQUESTED BY THE CXA FOR FINAL COMMISSIONING DOCUMENTATION.

23 09 00 - INSTRUMENTATION AND CONTROLS

- A. PROVIDE COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS (ATC). CONTROL SYSTEM SHALL BE CAPABLE OF PERFORMING ALL SEQUENCES OF OPERATION SHOWN ON THE DRAWINGS OR DESCRIBED IN THESE SPECIFICATIONS. INDIVIDUAL CONTROL COMPONENTS MAY NOT BE SHOWN ON CONTRACT DOCUMENTS, BUT THE CONTRACTOR SHALL SUPPLY ALL COMPONENTS, AND CONTROL WIRING NECESSARY FOR A COMPLETE OPERABLE SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SYSTEM COMPONENTS, WHETHER THE ELECTRICAL OR OTHER WORK IS SUBCONTRACTED OR NOT.
B. INSTALL THERMOSTATS AT MOUNTING HEIGHTS ABOVE FINISHED FLOOR IN ACCORDANCE WITH "ADA" REQUIREMENTS, OR AS DIRECTED OTHERWISE BY ARCHITECT.
C. ALL SAFETY SWITCHES AND CUT OUTS SHALL BE FIELD CALIBRATED AND SET PRIOR TO START-UP EQUIPMENT.
D. ALL CONTROL WIRING SHALL COMPLY WITH THE REQUIREMENTS OF THE ELECTRICAL SPECIFICATIONS.
E. SUBMIT TO ARCHITECT A POINT-TO-POINT WIRING DIAGRAM AND AIR PIPING LAYOUT SHOWING MANUFACTURERS AND MODEL NUMBERS OF ALL CONTROL COMPONENTS. INCLUDE WRITTEN DESCRIPTION OF SYSTEM OPERATION.
F. WIRING BETWEEN FIRE ALARM SYSTEM AND TEMPERATURE CONTROL SYSTEM, EXCEPT FOR DUCT MOUNTED SMOKE DETECTORS, SHALL BE BY MECHANICAL CONTRACTOR.
G. ROOM THERMOSTAT SENSORS AND TRANSMITTERS IN PUBLIC AREAS SHALL HAVE METAL COVER WITH TAMPER PROOF SCREWS AND CONCEALED ADJUSTMENT. THERMOSTATS FOR PRIVATE OFFICES SHALL HAVE EXPOSED DIAL FOR SETPOINT ADJUSTMENT. HEATING/COOLING THERMOSTATS SHALL HAVE AN ADJUSTABLE DEADBAND.
H. LOCAL CONTROLLERS, RELAYS, SWITCHES, AND OTHER CONTROL COMPONENTS SHALL BE MOUNTED ON ENCLOSED CONTROL PANELS WITH HINGE-LOCK DOOR MOUNTED NEXT TO SYSTEM CONTROLLED. TEMPERATURE SETTINGS, ADJUSTMENTS AND CALIBRATIONS SHALL BE MADE AT SYSTEM CONTROL PANEL. PANEL SHALL HAVE CANOPY LIGHT AND ON-OFF SWITCH.

23 21 00 - PIPING AND PUMPS

A. GENERAL REQUIREMENTS

- 1. PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS INDICATED IN SCHEDULE OF PIPE AND FITTING MATERIALS. PROVIDE DIELECTRIC FITTINGS TO CONNECT DIFFERENT PIPING MATERIALS.
2. PIPING 2-1/2 AND LARGER AND ALL DIRECT-BURIED PIPING SHALL BE WELDED STEEL. PIPING 2" AND SMALLER (EXCEPT DIRECT-BURIED PIPING) SHALL BE SCREWED STEEL OR COPPER. STEEL PIPING SHALL BE ASTM A53 OR A106, GRADE B, COPPER PIPING SHALL BE ASTM B88.
B. SCHEDULE OF PIPE AND FITTING MATERIALS
1. HOT WATER, 150 PSI WORKING PRESSURE. SCHEDULE 40 STEEL WITH THREADED STEEL JOINTS OR TYPE L COPPER WITH SOLDERED COPPER JOINTS.
2. CONDENSATE DRAIN (INCLUDING PUMPED CONDENSATE); 125 PSI WORKING PRESSURE. TYPE L COPPER WITH SOLDERED COPPER JOINTS.
C. VALVES AND STRAINERS
1. VALVES SHALL HAVE NAME OF MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON BODIES. VALVES OF SIMILAR TYPE SHALL BE BY A SINGLE MANUFACTURER. VALVES SHALL BE AS MANUFACTURED BY APOLLO, CRANE, HAMMOND, JENKINS, STOCKHOLM OR MILWAUKEE.
2. FOR WATER SERVICE, STRAINERS SHALL BE FULL SIZE OF EXTERNAL PIPE SIZE AND HAVE A MAXIMUM CLEAN PRESSURE DROP OF ONE PSI FOR STEAM CONDENSATE (14 PSI). STRAINERS SHALL BE PER MANUFACTURER'S TABLE BY SARCO, WATTS, OR ARMSTRONG. INSTALL STRAINERS AT LOCATIONS THAT WILL ALLOW REMOVAL OF SCREENS FOR CLEANING.

D. COMBINATION BALANCING AND SHUT-OFF VALVES

- 1. PROVIDE CALIBRATED COMBINATION BALANCING SHUT-OFF VALVES AS INDICATED ON THE PLANS. ACCEPTABLE MANUFACTURERS SHALL BE ARMSTRONG, BELL AND GOSSET, FLOWSET, OR TACO.

E. AUTOMATIC FLOW CONTROL VALVES

- 1. PROVIDE AUTOMATIC PRESSURE COMPENSATING FLOW CONTROL VALVES BY GRISWOLD, FDI OR T&A AS INDICATED ON THE PLANS. VALVES SHALL BE FACTORY SET AND SHALL AUTOMATICALLY LIMIT THE RATE OF FLOW TO WITHIN 5 PERCENT OF THE SPECIFIED CAPACITY.

23 25 00 - HVAC WATER TREATMENT

- A. PROVIDE THE SERVICES OF AN EXPERIENCED HVAC WATER-TREATMENT SERVICE PROVIDER CAPABLE OF ANALYZING WATER QUALITIES, INSTALLING WATER-TREATMENT EQUIPMENT, AND APPLYING WATER TREATMENT TO MINIMIZE CORROSION, SCALE BUILDUP, AND BIOLOGICAL GROWTH FOR OPTIMUM EFFICIENCY OF HVAC EQUIPMENT WITHOUT CREATING A HAZARD TO OPERATING PERSONNEL OR THE ENVIRONMENT. 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.

B. CLOSED LOOP SYSTEMS

- 1. PROVIDE CLOSED LOOP SYSTEM WITH WATER TREATMENT CONSISTING OF 5 GALLON BY-PASS SHOT FEEDER TO FEED CHEMICAL SOLUTION INTO EACH PIPING SYSTEM.
2. FLUSH AND CLEAN ALL SYSTEMS WITH DEARBORN BC-45 CLEANER AFTER COMPLETION OF INSTALLATION. AFTER CLEANING, ADD NITRITE INHIBITOR TO CLOSED LOOP SYSTEMS, TO CONTROL NITRITE STRENGTH TO 800-1000 PPM. MAXIMUM SUBMIT WRITTEN REPORT INDICATING THAT SYSTEMS HAVE BEEN THOROUGHLY CLEANED AND CHARGED WITH CORROSION INHIBITOR.
3. SYSTEM CONTAINING GLYCOL SHALL BE CHARGED TO THE PERCENT BY VOLUME INDICATED ON THE DRAWING. SUBMIT WRITTEN REPORT INDICATING THAT SYSTEMS HAVE BEEN PROPERLY CHARGED.
4. PROVIDE ONE YEAR SERVICE INCLUDING MAINTAINING CHEMICALS AND MAINTAINING FEEDING DEVICES, AS WELL AS ANALYZING WATER SAMPLES.

23 31 00 - HVAC DUCTS

A. GENERAL REQUIREMENTS

- 1. FOR GALVANIZED DUCTWORK, SEAL AIR DUCT JOINTS AND JOINTS BETWEEN FITTINGS AND DUCTS WITH HARDCAST SEALANT OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DUCTWORK SHALL BE FREE FROM VIBRATION UNDER ALL CONDITIONS OF OPERATION.
3. DIFFUSER & REGISTER LOCATIONS SHALL BE COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLANS.
4. DIFFUSER SIZES SHOWN ARE NECK SIZES; REGISTER AND GRILLE SIZES ARE NOMINAL.
5. ALL DUCTS PENETRATING RATED FIRE WALLS SHALL BE PROVIDED WITH FIRE DAMPERS AND ACCESS DOORS.
6. DUCTWORK SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
7. PATCH AND SEAL ALL EXISTING OPENINGS IN DUCTWORK NOT UTILIZED FOR NEW LAYOUT.
8. THE INSIDE OF ALL UNLINED DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
9. WHEN SECTION OF DUCTWORK IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED DUCT SHALL PREVAIL. SIZE OF DUCT RUN-OUTS TO DIFFUSER SHALL EQUAL DIFFUSER NECK SIZE.
10. DUCT BRANCH CONNECTIONS AND TAKE OFFS SHALL BE MADE WITH 45° CONNECTION, BELLMOUTH OR CONICAL ONLY. SPIN IN COLLARS AND STRAIGHT TAPS SHALL NOT BE USED.
11. ELBOWS AND BENDS FOR RECTANGULAR DUCTS SHALL HAVE CENTER LINE RADIUS OF 1.5 TIMES DUCT WIDTH WHEREVER POSSIBLE. WHERE CENTERLINE RADIUS IS LESS THAN 1.5 TIMES DUCT WITH, ELBOWS SHALL BE RADIUS THROAT WITH RADIUS HEEL AND FULL-LENGTH SPLITTER VANES.
12. NO PIPE, CONDUIT, HANGER, ARCHITECTURAL ELEMENT NOR STRUCTURAL MEMBER SHALL PASS THROUGH DUCT WITHOUT ARCHITECT'S AND/OR ENGINEER'S WRITTEN APPROVAL.

B. SHEETMETAL DUCTWORK

- 1. SHEET METAL DUCTS SHALL BE CONSTRUCTED OF HOT DIPPED G90 GALVANIZED SHEET METAL UNLESS OTHERWISE SPECIFIED. MATERIAL, CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF MOST RECENT EDITIONS OF SMACNA STANDARDS (EXCEPT FOR MORE STRINGENT REQUIREMENTS SPECIFIED OR SHOWN ON DRAWINGS). ALL MEDIUM PRESSURE DUCTWORK BETWEEN MAIN SYSTEM FAN AND AIR TERMINAL DEVICES SHALL BE MINIMUM 4"(wg) PRESSURE CLASS, SEAL CLASS A, LEAKAGE CLASS 6. ALL LOW-PRESSURE DUCTWORK BETWEEN TERMINAL DEVICE AND AIR OUTLETS SHALL BE MINIMUM 2"(wg) PRESSURE CLASS. SEAL CLASS B, LEAKAGE CLASS 12
2. KITCHEN HOOD EXHAUST DUCTS SHALL BE 16 GA. ALL WELDED CARBON STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH NFPA-96.
3. SHOWER EXHAUST DUCTWORK SHALL BE ALUMINUM WITH WELDED SEAMS. DUCTWORK SHALL PITCH TOWARDS SHOWERS.
C. FLEXIBLE DUCTWORK
1. FLEXIBLE DUCTWORK, CONNECTING TO UNINSULATED OR UNLINED DUCT, SHALL BE VINYL COATED FIBERGLASS CLOTH (0.005" MINIMUM THICKNESS, 25 STRANDS PER INCH MINIMUM THREAD COUNT WITH CORROSION-RESISTANT HELICAL WIRE REINFORCEMENT. FLEX DUCT SHALL BE UL RATED FOR 12" W.C. POSITIVE PRESSURE, 2" W.C. NEGATIVE PRESSURE WITH A MAXIMUM VELOCITY OF 4000 FPM. FLEXDUCT MUST BE LISTED AS A CLASS 1 CONNECTOR ACCORDING TO UL 181 AND SHALL MEET THE REQUIREMENTS OF NFPA 90A. MAXIMUM ASTM E-84 FIRE HAZARD RATING SHALL BE 25 FLAME SPREAD, 50 FUEL CONTRIBUTED, AND 50 SMOKE DEVELOPED. UNINSULATED FLEXIBLE DUCT SHALL BE EQUIVALENT TO FLEXMASTER TYPE 4.
2. FLEXIBLE DUCT CONNECTED TO INSULATED OR LINED DUCT SHALL BE INSULATED WITH 1-1/2", 1/2 LB. DENSITY FIBERGLASS INSULATION AND FLAME RETARDANT (UL LISTED) VAPOR BARRIER, MEETING ASTM E-84 RATING AS REFERENCED ABOVE.
3. FLEXIBLE DUCTS SHALL NOT EXCEED 5 FEET LONG AND SHALL BE USED FOR STRAIGHT RUN ONLY, NO OFFSETS OR TURNS. MAXIMUM SAG OF 1/2" PER 1'-0".
4. HANGER AND SADDLE IN CONTACT WITH FLEXIBLE DUCT SHALL BE WIDE ENOUGH TO PREVENT RESTRICTION OF INTERNAL DUCT DIAMETER WHEN WEIGHT OF SUPPORTED SECTION RESTS ON HANGER OR SADDLE MATERIAL.
5. COLLARS TO WHICH FLEXIBLE DUCTS ARE ATTACHED SHALL BE AT LEAST 2' LONG. SLEEVES FOR JOINING SECTIONS OF FLEXIBLE DUCT SHALL BE AT LEAST 4' LONG.
6. APPLY SEALING COMPOUND TO METALLIC SURFACE AT CONNECTION OF FLEXIBLE DUCT WITH SHEET METAL DUCTS, COLLARS AND MIXING BOXES. SLIP FLEXIBLE DUCTWORK OVER SEALING COMPOUND, COMPLETE SEAL WITH 1/2" WIDE, COMMERCIALY-MADE METAL DRAW BANDS.

23 33 00 - AIR DUCT ACCESSORIES

A. ACOUSTICAL DUCT LINING

- 1. PROVIDE UL-LISTED, 1" THICK (UNLESS OTHERWISE NOTED) 1.5 LB DENSITY, BY CERTAIN-TEED, KNAUF, OWENS CORNING OR MANVILLE FIBERGLASS ACOUSTICAL LINING WITH ANTIMICROBIAL COATING FOR THE FOLLOWING DUCTWORK:
a. SUPPLY AND RETURN AIR DUCTWORK (INCLUDING PLENUMS) FOR MINIMUM OF 20 FEET DOWNSTREAM OF AIR HANDLING UNITS (OR TO SOUND ATTENUATOR IF ATTENUATOR IS LOCATED FURTHER THAN 20' FROM FAN).
b. EXHAUST DUCTWORK, INCLUDING PLENUMS, FOR MINIMUM OF 20 FEET UPSTREAM AND DOWNSTREAM OF FANS.
c. TRANSFER DUCTS
d. FOR A MINIMUM OF 10 FEET DOWNSTREAM OF VAV BOXES.
e. DUCTWORK INDICATED AS LINED ON DRAWINGS.
2. DIMENSIONS SHOWN ON DRAWINGS FOR DUCTWORK ARE NET INSIDE DIMENSIONS. INCREASE SHEETMETAL SIZE FOR LINING WHERE SPECIFIED.
3. MATERIALS AND INSTALLATION SHALL MEET THE FOLLOWING STANDARDS, AS APPLICABLE: NFPA-90A, UL723, NFPA-255; SMACNA DUCT LINER APPLICATIONS STANDARD; SMACNA MECHANICAL FASTENERS STANDARD; ADHESIVE AND SEALANT COUNCIL, ADHESIVES STANDARD FOR DUCT LINER - ASC-A-7001A; ASTM E-84 FIRE HAZARD CLASSIFICATIONS OF 25 FLAME SPREAD, 50 SMOKE DEVELOPED, AND 50 FUEL CONTRIBUTED.

B. ADJUSTABLE MANUAL BALANCING DAMPERS:

- 1. GENERAL: NOT ALL MANUAL BALANCING DAMPERS MAY BE SHOWN ON THE PLANS FOR CLARITY. PROVIDE MANUAL ADJUSTABLE VOLUME DAMPERS, WITH EXTENDED MOUNT INDICATING AND LOCKING QUADRANTS ON EACH SUPPLY, RETURN, AND GENERAL EXHAUST DUCT TAKEOFF, AND AT EACH TAKEOFF TO A REGISTER, GRILLE, OR DIFFUSER. DAMPERS SHALL BE LOCATED AS FAR UPSTREAM AS POSSIBLE IN THE BRANCH DUCT OR TAKE OFF TO MINIMIZE DOWNSTREAM NOISE.
2. REMOTE ADJUSTABLE VOLUME DAMPERS: PROVIDE REMOTE ADJUSTABLE VOLUME DAMPERS IN AREAS WHERE CEILING CAVITY ACCESS IS LIMITED BY HARD (SOLID) CEILINGS, EQUIPMENT OBSTRUCTIONS, ARCHITECTURAL FEATURES, ETC. COORDINATE BETWEEN MECHANICAL PLANS AND ARCHITECTURAL CEILING PLANS TO DETERMINE IF AND WHERE REMOTE ADJUSTABLE VOLUME DAMPERS ARE REQUIRED. MANUALLY ADJUSTED REMOTE VOLUME DAMPERS SHALL BE SIMILAR TO YOUNG REGULATOR MODEL 270.

C. FIRE DAMPERS

- 1. PROVIDE FIRE DAMPERS AND ACCESS DOORS THROUGHOUT AIR DISTRIBUTION SYSTEM AS SHOWN ON DRAWINGS, AND WHERE DUCTS PENETRATE FIRE WALLS.
2. DYNAMIC, RATED AND LABELED ACCORDING TO UL 555 BY AN NRTL. CLOSING RATING IN DUCTS UP TO 4-INCH WG STATIC PRESSURE CLASS AND MINIMUM 2000-FPM VELOCITY. TYPE B WITH BLADES OUTSIDE AIR STREAM. REPLACEABLE, 165 DEG F RATED, FUSIBLE LINKS. ACCEPTABLE MANUFACTURERS: GREENHECK, RUSKIN, NAILOR, POTTORFF.

D. FLEXIBLE CONNECTIONS

- 1. MAKE ALL CONNECTIONS BETWEEN AIR HANDLING UNITS AND DUCTWORK AND BETWEEN FANS AND DUCTWORK WITH FLEXIBLE CONNECTIONS. FOR INDOOR APPLICATIONS, FLEXIBLE CONNECTIONS SHALL BE NEOPRENE-COATED FIBROUS GLASS FIRE RETARDANT FABRIC, BY VENTFABRICS, OR DURODYNE. FOR OUTDOOR APPLICATIONS, FLEXIBLE CONNECTIONS SHALL BE DUPONT HYPALON-COATED FIBROUS GLASS FIRE-, WEATHER-, AND UV-RESISTANT BY VENTFABRICS OR DURODYNE.

E. DUCTWORK SILENCERS (SOUND ATTENUATORS)

- 1. PROVIDE PREFABRICATED DUCT SILENCERS AS SCHEDULED AND AS DESCRIBED HEREIN, AT LOCATIONS SHOWN ON DRAWINGS, BY INDUSTRIAL ACOUSTICS, UNITED SHEET METAL, VIBRO-ACOUSTICS, SEMCO, OR TITUS. SILENCERS SHALL HAVE FLAME SPREAD/SMOKE DEVELOPED OF 25/50 ACCORDING TO ASTM E-84.
2. MINIMUM DYNAMIC INSERTION LOSS AND MAXIMUM SELF GENERATED SOUND POWER LEVELS SHALL BE EQUIVALENT TO INDUSTRIAL ACOUSTICS TYPES "S," "MS," "ML," AND "L." MINIMUM DYNAMIC INSERTION LOSS SHALL BE AT 1000 FPM FOR HIGH PRESSURE DROP SILENCERS AND 2000 FPM FOR MEDIUM AND LOW PRESSURE DROP SILENCERS.
3. DUCT SILENCERS SHALL BE INSTALLED WITH APPROPRIATE INLET AND OUTLET STRAIGHT LENGTH DUCT CONDITIONS TO MAINTAIN THE MANUFACTURER'S TABULATED PRESSURE DROPS, WITHOUT ADJUSTMENT FACTORS.

23 37 00 - AIR OUTLETS AND INLETS

- A. PROVIDE DIFFUSERS, REGISTERS, AND GRILLES FOR SUPPLY, RETURN, AND EXHAUST OUTLETS, OF SIZE, TYPE, MATERIAL AND DESIGN SHOWN ON DRAWINGS. ACCEPTABLE MANUFACTURERS: KRUEGER, NAILOR, METALAIR, TITUS, OR PRICE. SOUND PRESSURE LEVELS SHALL NOT EXCEED NC 30. COLOR AND FINISH SHALL BE SELECTED BY THE ARCHITECT.
B. EXISTING TO REMAIN/BE REUSED DIFFUSERS/REGISTERS/GRILLES SHALL BE CLEANED, TOUCH-UP PAINTED AND RENDERED IN LIKE-NEW-CONDITION BY THE CONTRACTOR.

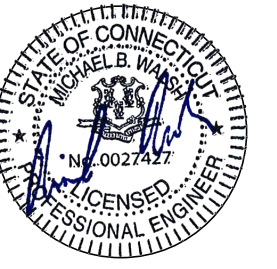
23 38 00 - AIR TERMINAL UNITS

- A. ALL BOXES SHALL HAVE PRESSURE INDEPENDENT ELECTRONIC CONTROLLERS AND MULTI-POINT FLOW SENSORS. UNITS SHALL NOT DEVIATE FROM THE SET MINIMUM OR MAXIMUM FLOW SETTINGS BY MORE THAN 10%, REGARDLESS OF INLET PRESSURE. INLET VELOCITY SHALL NOT EXCEED 2000 FPM. SOUND DATA SHALL BE IN ACCORDANCE WITH NOISE CRITERIA DATA SHOWN ON SCHEDULES AND SHALL BE CERTIFIED IN ACCORDANCE WITH AEC STANDARD 1062. BOX AIR LEAKAGE SHALL NOT BE MORE THAN 2% OF MAXIMUM AIRFLOW. PROVIDE INTEGRAL (HOT WATER) (ELECTRIC) REHEAT COILS SIZED AS INDICATED ON DRAWINGS. CASING SHALL BE GALVANIZED STEEL LINED WITH 1-1/2 POUND INSULATION. INSULATION SHALL BE TOTALLY ENCAPSULATED TO PREVENT FIBERS FROM ENTERING AIRSTREAM. PROVIDE CONTROL TRANSFORMER AS REQUIRED. ACCEPTABLE MANUFACTURERS: TITUS, ENVIROTEC, PRICE OR KRUEGER.

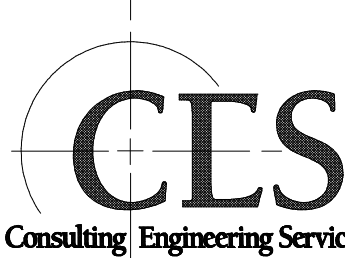
23 70 00 - CENTRAL HVAC EQUIPMENT

A. PACKAGED OUTDOOR ROOFTOP UNIT

- 1. PROVIDE PACKAGED DX ROOFTOP UNIT BY TRANE, DAIKIN OR JCI/VIOR. UNIT SHALL HAVE DX COOLING GAS HEATING AND MICROPROCESSOR BASED DISCHARGE AIR AND VARIABLE AIR VOLUME CONTROLS (FOR VAV UNITS). PROVIDE VARIABLE SPEED DRIVES FOR VAV UNITS. PROVIDE INSULATED PREFABRICATED ROOF CURB FOR MOUNTING THE UNIT. PROVIDE ALL NECESSARY SAFETY CONTROLS FOR FURNACE OR ELECTRIC COILS. PROVIDE MINIMUM OF FOUR STAGES OF CAPACITY CONTROL AND HOT GAS BYPASS FOR COMPRESSOR. REFRIGERANT SHALL BE R-410A.



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STATUS: ISSUED FOR BIDDING

REVISIONS:

Table with columns: MARK, DATE, DESCRIPTION. Contains one revision entry with a triangle in the mark column.

TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS
525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"

FILE NAME:
\\CESCT-PROJ01\PRODUCTION\PROJ_21\202124800 - CHESHIRE HIGH SCHOOL - HVAC\ARCH\TITLE.BLOCK

AUTHOR: Author
DRAFTER: Author
SCALE: AS NOTED
PRINT DATE: 02-04-2022
SHEET TITLE:

MECHANICAL DRAWING
SPECIFICATIONS

SHEET NUMBER:

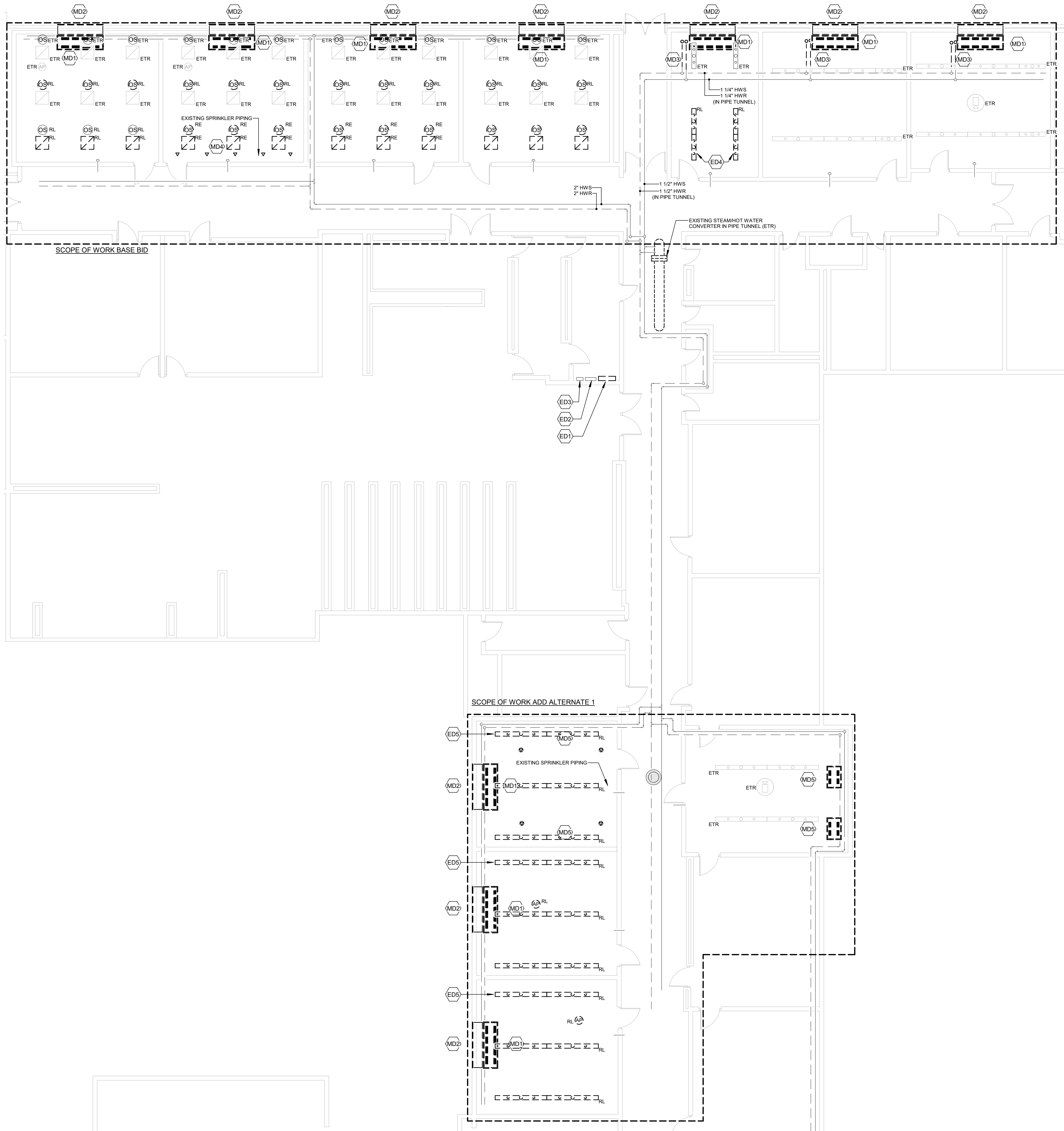
M7.01

ELECTRICAL DEMOLITION KEY NOTES

- (ED1) EXISTING 400A, 208/120V, 3PH PANELBOARD TO BE REMOVED AND REPLACED WITH NEW. EXISTING ACTIVE (ENERGIZED) CIRCUITS SHALL BE TEMPORARILY DISCONNECTED AND RE-FED FROM NEW PANELBOARD. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
- (ED2) EXISTING 225A, 208/120V, 3PH MAIN LUGS ONLY PANELBOARD TO REMAIN. PANELBOARD FEEDER SHALL BE INTERCEPTED AND RE-WIRED TO NEW PANELBOARD. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
- (ED3) EXISTING 150A, 208/120V, 3PH PANELBOARD TO REMAIN.
- (ED4) EXISTING LIGHT FIXTURE TO BE REWIRED/RELOCATED. EXISTING LIGHTING CIRCUIT WITHIN ROOM SHALL BE MADE SAFE FOR EXTENSION TO NEW LIGHT FIXTURES. LIGHTING FIXTURES WITH OCCUPANCY SENSOR PHYSICALLY MOUNTED ON FIXTURE SHALL REMAIN ON FIXTURE IF SCHEDULED FOR RELOCATION. REFER TO NEW WORK PLANS.
- (ED5) TYPICAL OF ALL FIXTURES IN ROOM) RELOCATE LIGHT FIXTURE AND ASSOCIATED OCCUPANCY SENSOR. REFER TO NEW WORK PLANS FOR REVISED LOCATION. EXTEND EXISTING WIRING AND CONDUIT AS REQUIRED.

MECHANICAL DEMOLITION KEY NOTES

- (MD1) REMOVE EXISTING FLOOR MOUNTED UNIT VENTILATOR & ASSOCIATED HEATING HOT WATER SUPPLY & RETURN BRANCH PIPING; CAP EXISTING PIPING BACK AT MAINS; REMOVE ALL VALVES, FITTINGS, HANGERS & SUPPORTS; REMOVE ALL EXISTING POWER WIRING & CONTROL WIRING; COORDINATE WITH ELECTRICAL CONTRACTOR. EXISTING PERIMETER HOT WATER HEATING PIPING SHALL REMAIN.
- (MD2) REMOVE EXISTING EXTERIOR INTAKE AIR LOUVER & ASSOCIATED DUCTWORK, DAMPERS, ACTUATORS & CONTROLS. EXISTING EXTERIOR WALL OPENING SHALL BE PATCHED BY OTHERS. REMOVE EXISTING UNIT VENTILATOR CASEWORK, PATCH WALL AND FLOOR.
- (MD3) DISCONNECT & REMOVE EXISTING HEATING HOT WATER BRANCH PIPING SERVING UNIT VENTILATOR FROM PIPE TUNNEL BELOW FLOOR SLAB; CAP EXISTING PIPE BACK AT MAINS;
- (MD4) EXISTING FIRE PROTECTION BRANCH PIPING & SIDEWALL SPRINKLERS SHALL BE RELOCATED & MODIFIED TO ACCOMMODATE NEW SUPPLY & RETURN AIR DUCTWORK; REFER TO FIRE PROTECTION DRAWING FP1.00
- (MD5) REMOVE EXISTING FLOOR MOUNTED CONNECTOR & ASSOCIATED HEATING HOT WATER SUPPLY & RETURN BRANCH PIPING; CAP EXISTING PIPING BACK AT MAINS; REMOVE ALL VALVES, FITTINGS, HANGERS & SUPPORTS; REMOVE ALL EXISTING POWER WIRING & CONTROL WIRING; COORDINATE WITH ELECTRICAL CONTRACTOR. EXISTING PERIMETER HOT WATER HEATING PIPING SHALL REMAIN.



1 MECHANICAL AND ELECTRICAL DEMOLITION FLOOR PLAN
1/8" = 1'-0"



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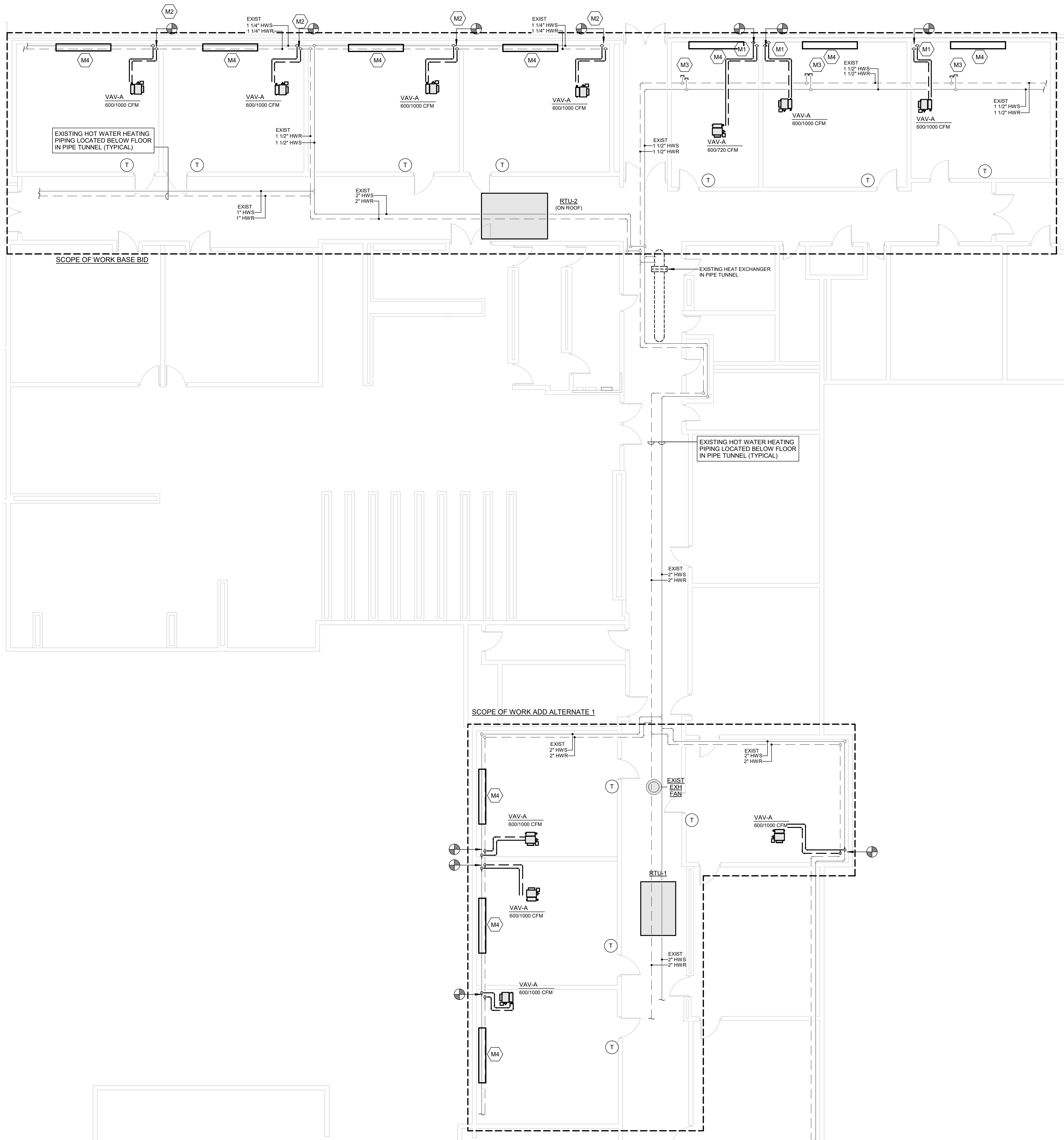
TOWN OF CHESHIRE
CHESHIRE HIGH SCHOOL
HVAC IMPROVEMENTS
525 South Main Street
Cheshire, CT 06410

PROJECT SEQ: RFP # 2223-10
PLOT SHEET SIZE: 24" x 36"
FILE NAME:
\\CESCT-PROD01\PRODUCTION\PROJ-21
2021248.00 - CHESHIRE HIGH SCHOOL - HVAC
ARCH\TITLE BLOCK
AUTHOR: DH/AC
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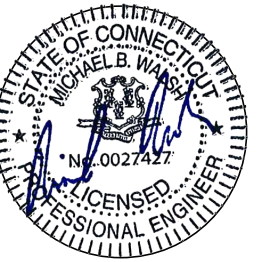
MECHANICAL AND ELECTRICAL DEMOLITION FLOOR PLAN

SHEET NUMBER:
MED1.00

MECHANICAL PIPING KEY NOTES	
M1	PROVIDE NEW 1" H.W. SUPPLY & RETURN BRANCH PIPING TO NEW VAV TERMINAL HOT WATER REHEAT COIL; CONNECT TO EXISTING HEATING HOT WATER MAINS IN PIPE TUNNEL; PROVIDE NEW ISOLATION BALL VALVES & REFER TO H.W. COIL PIPING DETAIL.
M2	PROVIDE NEW 1" H.W. SUPPLY & RETURN BRANCH PIPING TO NEW VAV TERMINAL HOT WATER REHEAT COIL; CONNECT TO EXISTING HEATING HOT WATER MAINS AT CEILING; PROVIDE NEW ISOLATION BALL VALVES & REFER TO H.W. COIL PIPING DETAIL.
M3	CAP EXISTING H.W. BRANCH PIPING SERVING UNIT VENTILATOR.
M4	FURNISH AND INSTALL 16 GAUGE SHEET METAL COVER IN PLACE WHERE UNIT VENTILATOR WAS REMOVED FROM CASEWORK TO PROVIDE CONTINUOUS CASEWORK ENCLOSING EXISTING FINNED TUBE RADIATOR AND ASSOCIATED PIPING.



1 MECHANICAL PIPING PLAN LEVEL 1
1/8" = 1'-0"



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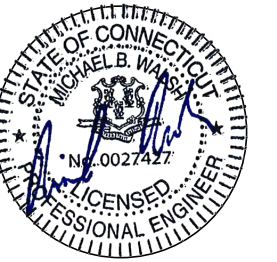
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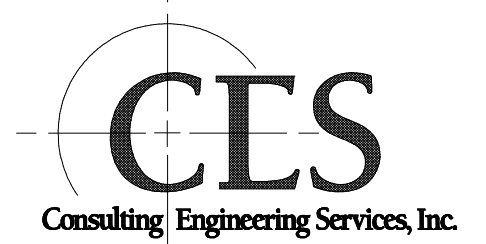
MECHANICAL PIPING FLOOR PLAN

SHEET NUMBER:

MP1.00



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PLUMBING ABBREVIATIONS,
NOTES AND SYMBOLS

SHEET NUMBER:

P0.00

GENERAL ABBREVIATIONS

AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
AHJ	AUTHORITY HAVING JURISDICTION
AP	ACCESS PANEL
AV	ACID VENT
AVTR	ACID VENT THRU ROOF
AW	ACID WASTE
BAS	BUILDING AUTOMATION SYSTEM
BTU	BRITISH THERMAL UNIT
BTUH	BTU / HOUR
BOP	BOTTOM OF PIPE
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CI	CAST IRON
CO	CLEANOUT
CW	COLD WATER
DIA	DIAMETER
DN	DOWN
DSN	DOWN SPOUT NOZZLE
DW	DIRECT WASTE
ELEC	ELECTRICAL
ET	EXPANSION TANK
EWS	EMERGENCY EYEWASH/SHOWER
F	DEGREES FAHRENHEIT
FCO	FLOOR CLEANOUT
FEE	FINISHED FLOOR ELEVATION
FGCO	FINISHED GRADE CLEANOUT
FLA	FULL LOAD AMPS
FLD	FLOOR DRAIN
FS	FLOOR SINK
FT	FEET
FT WG	FEET HEAD
G	GAS
GALL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSV	GAS SOLENOID VALVE
GW	GREASE WASTE
GV	GAS VENT
HB	HOSE BIB
HW	HOT WATER
HD	HEAD
HP	HORSEPOWER
HZ	HERTZ
HWR	HOT WATER RECIRCULATION
INT	INTERCEPTOR
INV ELEV	INVERT ELEVATION
IW	INDIRECT WASTE
KW	KILOWATT
LAV	LAVATORY
MAX	MAXIMUM
MECH	MECHANICAL
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
NIC	NOT IN CONTRACT
NG	NATURAL GAS
NTS	NOT TO SCALE
OD	OVERFLOW DRAIN
OW	OIL WASTE
PCD	PUMPED CONDENSATE DRAIN
PLBG	PLUMBING
PSIG	POUNDS PER SQUARE INCH GAUGE
QTY	QUANTITY
RD	ROOF DRAIN
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RTU	ROOFTOP UNIT
SAN	SANITARY
SQFT / SF	SQUARE FEET
SS	SOIL STACK
ST	STORM
SST	SECONDARY STORM
TEMP	TEMPERATURE
TW	TEMPERED WATER
TYP	TYPICAL
V	VENT
VS	VENT STACK
VTR	VENT THRU ROOF
W	WASTE
WS	WASTE STACK
W&V	WASTE AND VENT

PLUMBING PIPING LEGEND

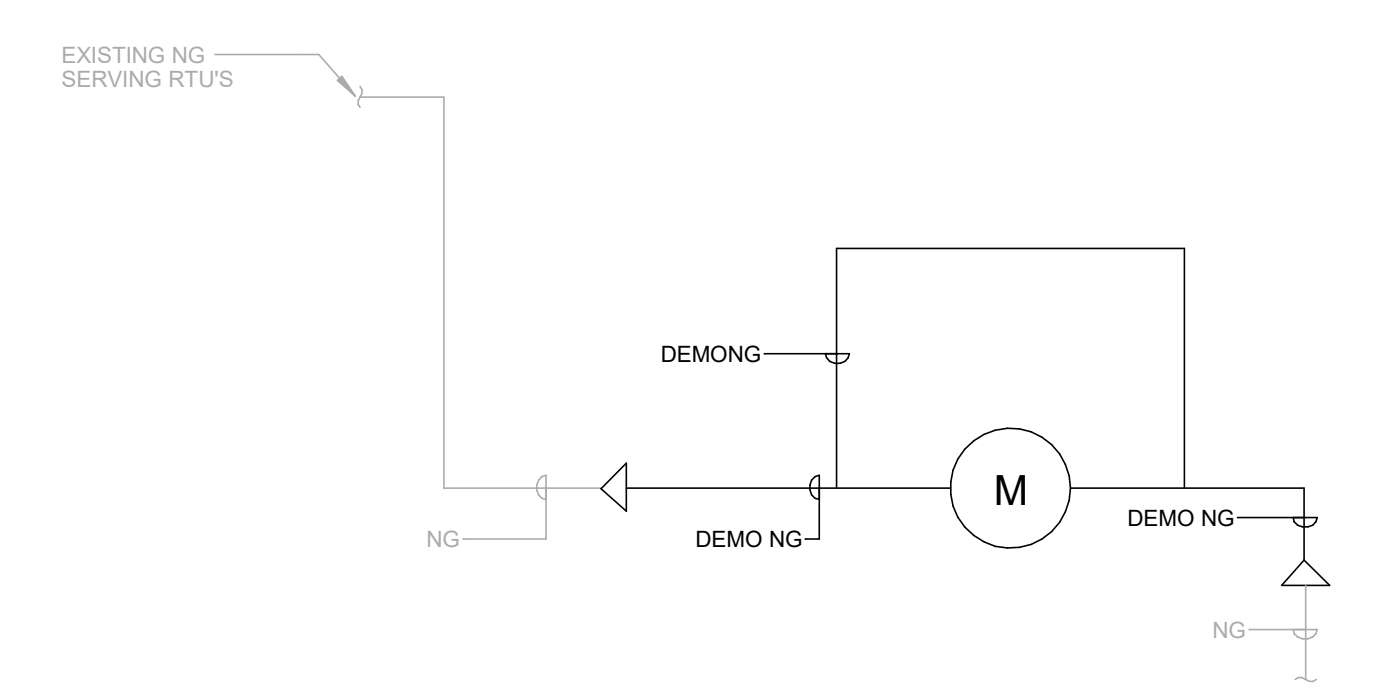
SYMBOL	DESCRIPTION
—NG—	NATURAL GAS
—R—	PIPE RISE
—D—	PIPE DROP
—T—	PIPE TEE TOWARDS (UP IN PLAN)
—T—	PIPE TEE AWAY (DOWN IN PLAN)
—D&R—	PIPE DROP AND RUN
→	DIRECTION OF FLOW
—T—	PIPE TRAP
—D—	DIRT LEG
—C—	CLEANOUT
—U—	UNION OR FLANGE
—B—	BLIND FLANGE
—E—	END CAP
—R—	REDUCER

VALVE AND SYMBOL LEGEND

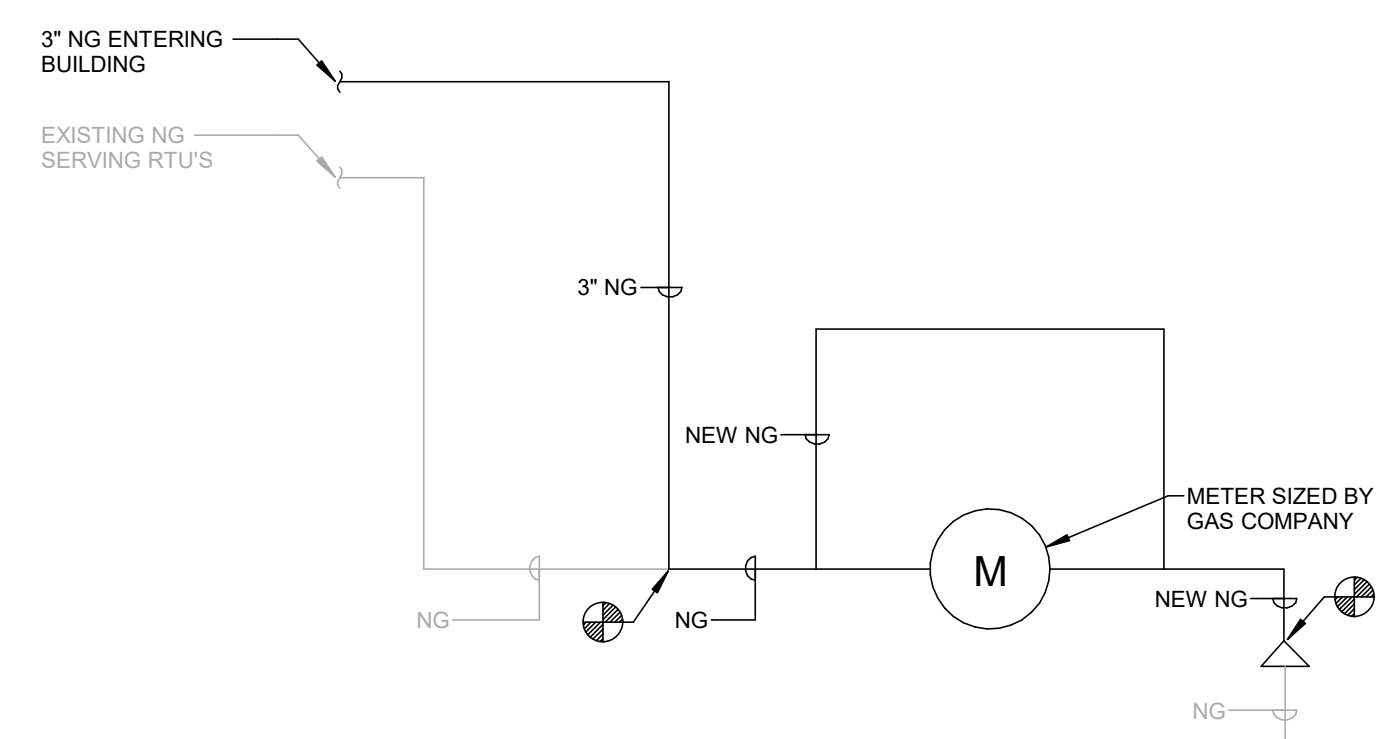
SYMBOL	DESCRIPTION
—B—	BALL VALVE
—B&H—	BALL VALVE WITH HOSE BIBB, CAP & CHAIN (DRAIN VALVES)
—P—	PRESSURE REDUCING VALVE
—C—	CHECK VALVE
—S—	SOLENOID VALVE
—GM—	GAS METER

PLUMBING GENERAL NOTES

- THESE GENERAL NOTES ARE APPLICABLE TO ALL PLUMBING DRAWINGS.
- DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL INTENT OF WORK, SEE DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- CONTRACTOR MUST REVIEW DRAWINGS OF THE OTHER TRADES AS PART OF THIS CONTRACT FOR ADDITIONAL WORK REQUIRED AND OR COORDINATION OF HIS WORK FOR OPERATIONS OR CONNECTIONS TO OTHER SYSTEM.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING & INSTALLING ALL SERVICES TO HVAC EQUIPMENT INCLUDING BUT NOT LIMITED TO: GAS SUPPLY PIPING, DRAINS, & CONNECTIONS TO AIR HANDLING UNITS ETC. ALSO, DEVICES REQUIRED INCLUDE BACKFLOW PREVENTERS, REGULATORS, UNIONS, TRAPS, & SHUT-OFF VALVES REQUIRED FOR THIS EQUIPMENT. REFER TO MECHANICAL DWGS. FOR ADDITIONAL INFORMATION AND COORDINATION.
- THE CONTRACTOR SHALL PROVIDE PIPE EXPANSION JOINTS ON PIPING PASSING THRU ALL BUILDING EXPANSION JOINT LOCATIONS AS REQUIRED PER BUILDING CODES WHETHER OR NOT SHOWN ON DRAWINGS. REVIEW ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXACT BUILDING EXPANSION JOINT LOCATIONS AND EXPANSION DIMENSIONS.



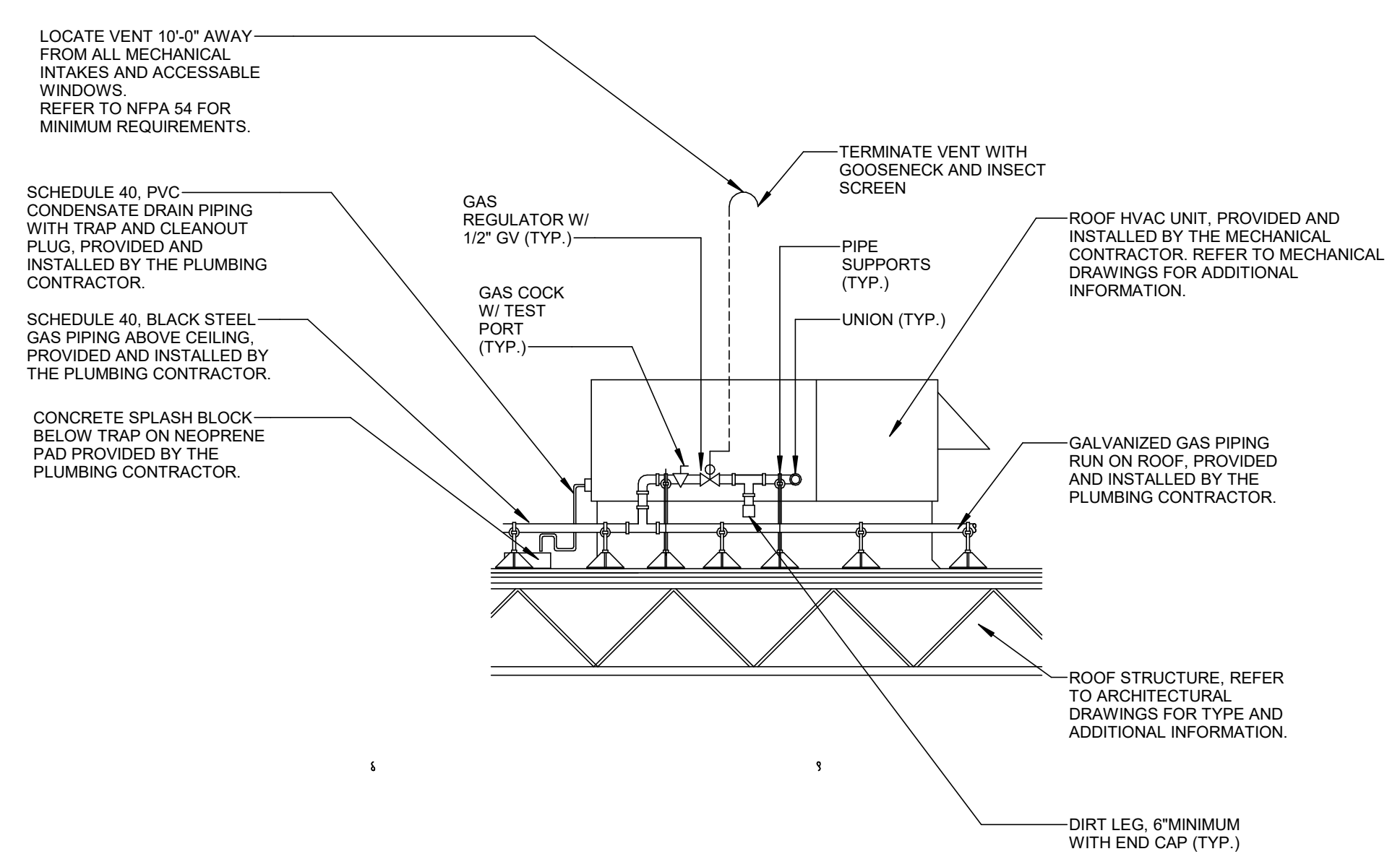
GAS METER DEMOLITION RISER DIAGRAM



NEW GAS METER DESIGN RISER DIAGRAM

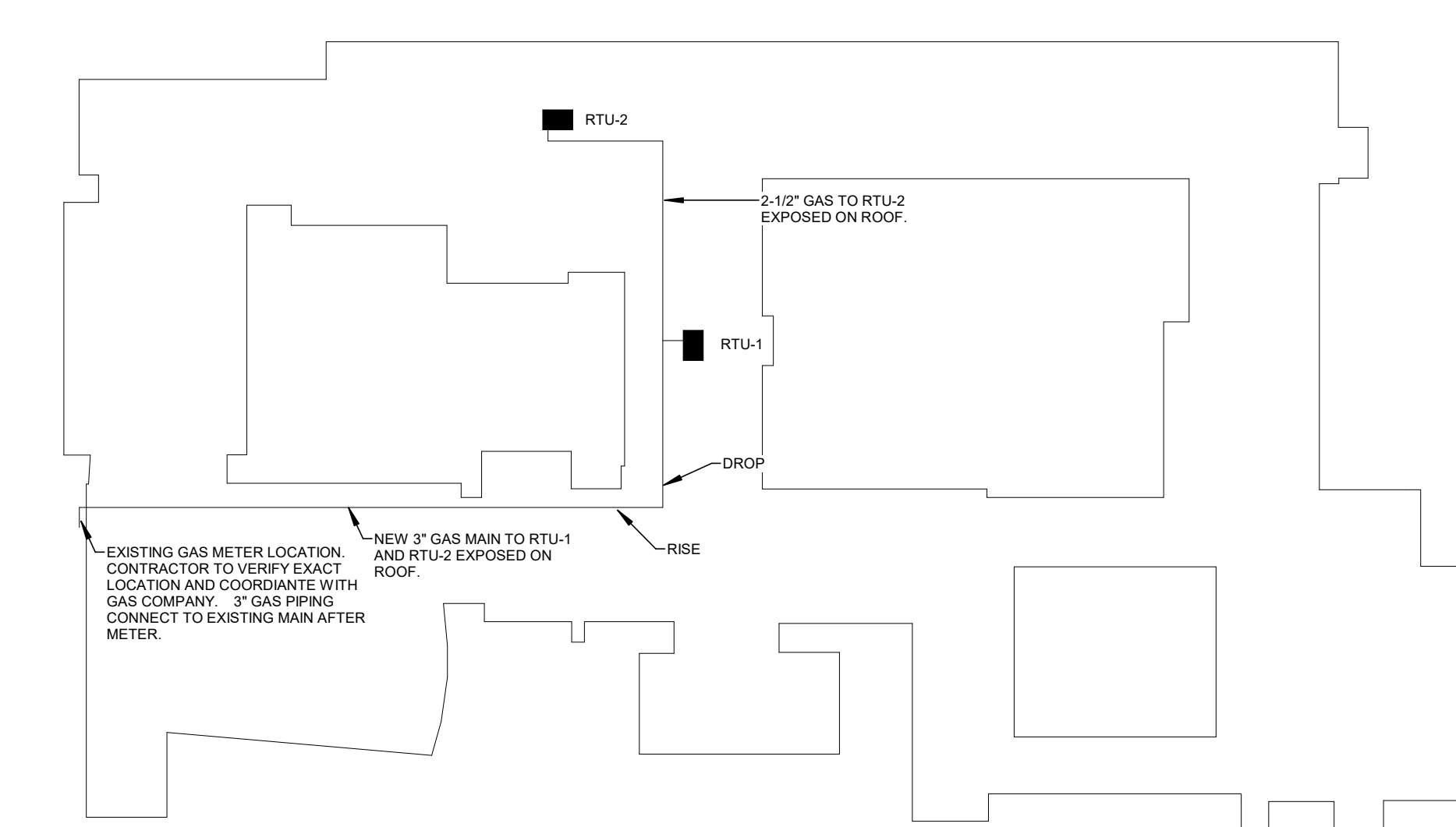
NOTE:
1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL INTENT OF THE GAS METER LAYOUT. NOT ALL VALVES AND REQUIREMENTS ARE SHOWN.

3 GAS METER DIAGRAM
NTS



- NOTES:
- ALL GAS PIPING ABOVE ROOF SHALL BE PAINTED WITH 2 COATS OF RUST INHIBITIVE PAINT. (UNLESS SPECIFIED AS GALVANIZED).
 - COORDINATE LOCATION OF GAS CONNECTION WITH EQUIPMENT LOCATION AND MECHANICAL CONTRACTOR IN THE FIELD.
 - THE CONTRACTOR SHALL PROVIDE AND INSTALL PIPE SUPPORTS UNDER ALL GAS PIPING SERVING ROOF TOP UNITS. SUPPORTS SHALL BE SPACED 2' TO 4' APART UP TO A MAXIMUM OF 6' TO 10' APART. SUPPORTS SHALL BE PLACED SO THE PIPING RESTS IN THE CENTER OF THE RUBBER ROLLER. THE HEIGHT ADJUSTMENTS SHOULD BE LEVELED AND THE STANDS SHOULD BE SPACED SO THAT WEIGHTS ARE EVENLY DISTRIBUTED. PIPE SUPPORT SHALL BE MAPA PRODUCTS MODEL MS-4LX OR ENGINEERED APPROVED EQUAL. SUPPORT SHALL BE SUPPLIED WITH THE FOLLOWING: 3/8" STAINLESS STEEL THREADED RODS, ADJUSTMENTS HEIGHTS SHALL BE FROM 3" TO 10". PIPE ROLLER SHALL BE OF BLACK RUBBER WITH NYLON SPACER. SUPPORT BASE SHALL BE FIBERGLASS REINFORCED NYLON WITH DISPERSED CARBON BLACK TO PROVIDE WEATHERING RESISTANCE AND UV STABILIZATION. BASE DIMENSIONS SHALL BE 5" X 10". SUPPORT PAD SHALL BE 1/2" THICK BLACK NEOPRENE. COORDINATE MODEL WITH PIPE SIZE TO UNITS AS REQUIRED IN THE FIELD.

1 GAS CONNECTION TO MECHANICAL EQUIPMENT DETAIL
1/8" = 1'-0"



2 EXTERIOR NG PIPING ON ROOF PLAN
NTS

