

**PROJECT MANUAL
VOLUME 1 OF 1**



AKF

One Audubon Street, 5th Floor
New Haven, CT 06511
T: 203-323-4333

**AKF #
190911-000**

**Auditorium AC Upgrade
Western Middle School
1 Western Junior Highway
Greenwich, Connecticut**

Greenwich Public Schools

Date: November 13, 2020

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GREENWICH PUBLIC SCHOOLS
Purchasing Department
290 Greenwich Avenue
Greenwich, Connecticut 06830
(203) 625-7411 Email: eugene_watts@greenwich.k12.ct.us

EUGENE H. WATTS
Senior Buyer

November 24, 2020

Dear Sir/Madam:

You are invited to submit a Bid for the Western Middle School Auditorium AC Upgrade for Greenwich Public Schools. The attached bid specifications detail the service requirements.

Bidders are urged to read all documents carefully and fill out all information requested. Bids which are incomplete, obscure, or conditional, and which contain irregularities of any kind, will be subject to rejection for failure to comply strictly with these conditions.

Bids must be submitted on the schedule form attached hereto. All unit prices must be filled in. Each bid must be submitted with (1) original copy/set, and eight (8) copies/sets of the bid. Bidders must submit bids in a clear, concise and legible manner so as to permit proper evaluation of responsive bid. Faxed or emailed bids will not be accepted however, hand delivered, mailed or overnight bids will be accepted Monday through Friday between the hours of 8:30am -12:00pm and 1:00pm - 3:00pm in the Central Receiving Department located in the Arch Street parking lot, or by mail. The original Bid and copies must be in a sealed envelope plainly marked:

Western Middle School Auditorium AC Upgrade

Opening Date: December 15, 2020

Opening Time: 10:00 a.m.

Bid Number: 2312-20

Mandatory Walk-through (Mask required)

Western Middle School Auditorium

1 Western Junior Highway

Greenwich CT 06830

December 1, 2020 @ 3:30 p.m.

Sealed proposals for supplying the above will be received by the Purchasing Department at the above address until 10:00 a.m. at which time they will be opened and read.

All responses are subject to change based on the status of the COVID 19 pandemic and Federal Ordinances.

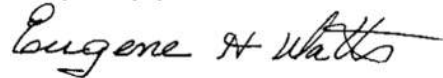
In accordance with the Governor's current public meeting requirements and in order to limit the spread of COVID-19, the meeting for the bid opening will be held remotely by telephone in real time. The details to join the BID #2312-20 meeting remotely are as follows:

Dial-In by phone:

(US) 1 573-349-0294 PIN: 242 365 677#

The meeting will be recorded and the recording will be made available on the school district's website within seven days.

Very truly yours,

A handwritten signature in cursive script that reads "Eugene H. Watts".

Eugene H. Watts

SECTION 000301 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 The **Greenwich Public Schools**, Greenwich, CT, invites bid proposals for the following:

A. **Auditorium AC Upgrade** for the Greenwich Public Schools at the following school:

Western Middle School: 1 Western Junior Highway, Greenwich, CT

1.2 BACKGROUND:

A. TOWN / DISTRICT: The Town of Greenwich is approximately 30 miles northeast of New York City and has a population of about 62,000 residents. The Greenwich Public Schools enjoy a national reputation for excellence and have strong support from the community. The fifteen public schools have an enrollment of 9,000 students and consists of eleven elementary schools (K-5), the middle schools (6-8), and one comprehensive high school (9-12).

B. ENGINEER: AKF, 1 Audubon St., 5th Floor, New Haven, CT 06511

1.3 SCHEDULE:

A. Bidding Documents Available:

1. Digital Viewing: Beginning at 12:00 PM on **November 24, 2020**, Project Specifications can be viewed at the Greenwich Public Schools website:
www.greenwichschools.org

B. Pre-Bid Conference:

1. Date: **December 1, 2020**
2. Time: **3:30 PM**
3. Location: **Western Middle School**
4. Address: **1 Western Junior Highway, Greenwich, CT**
5. Mandatory: **Prospective bidders are required to attend.**

C. Bid Due Date:

1. Sealed proposals will be received as indicated below, and at that time and place will be publicly opened and read aloud.
2. Date: **December 15, 2020**
3. Time: **10:00 AM local time**
4. Location: **District Offices**
5. Address: GREENWICH PUBLIC SCHOOLS, 290 Greenwich Ave., Greenwich, Connecticut 06830, (203) 625-7411
6. All bidders and other interested persons are invited to a virtual bid opening. Refer to

Invitation to Bid for details to join the meeting remotely.

D. QUESTIONS:

1. Questions concerning this bid will be received by email only and directed to:
 - a. bid_department@greenwich.k12.ct.us.
2. In the subject line you must put **BID #2312-20, Auditorium AC Upgrade – (WMS)**
3. All questions must be submitted no later than noon on **December 4, 2020**.
4. All answers to bidder's questions will be provided by written BID ADDENDUM by noon on **December 9, 2020**. It is the responsibility of all bidders to check www.greenwichschools.org for all current addenda up to 48 hours before the bid is due.
5. Failure to comply with these conditions will result in the bidder waiving his right to dispute the bid specifications and conditions.

1.4 BID SUBMISSION / REQUIREMENTS:

- A. Each bid shall be signed and accompanied by a bid security payable to the Town of Greenwich in the amount of ten (10%) of the bid and shall be in the form of a Bid Bond only as issued in the bid documents. Bid Bonds must use the Greenwich Public Schools Bid Bond Form (included within the bid documents), issued by a surety company listed on the current U.S. Dept of Treasury's Federal Register and be licensed to underwrite bonds in the State of Connecticut.
- B. Each bid shall be accompanied by a completed copy of the CONTRACTOR'S QUALIFICATION STATEMENT included in the bid documents. The Greenwich Public Schools reserves the right to request further information and/or supplemental information with respect to the QUALIFICATION STATEMENT at their sole discretion.
- C. Each bidder shall utilize the specified manufacturers. Should the contractor desire to substitute other articles, materials, apparatus, products or process, other than those specified or approved as equal, the contractor shall apply to the architect, in writing, for approval of such substitution. It should be noted that the bid shall not be based on a substituted article, material, apparatus, product or process. No substitution review shall take place prior to bid.
- D. Each form of the bid contains a section for alternates and for unit prices. All alternates prices must be completed with a dollar value. Blanks, "Not Applicable" (N/A), "No Effect", etc in these portions of the BID FORM shall be construed to indicate that the particular alternate shall be performed without increased to the contract price as they relate to the scope of the trade package.
- E. Unit prices which do not affect the work all the bidder's trade may be filled in "Not Applicable" or "(N/A)". "Not Applicable" or Blanks in these Bid Forms shall be construed to indicate that the unit price is not applicable as it relates to the scope of the trade package.
- F. TAX: No amount shall be added for the Connecticut sales tax or Federal tax. The Greenwich Public School system is exempt from the payment of taxes imposed by the Federal government and/or State of Connecticut. Taxes must not be included in the bid price.

- G. PERMIT FEES: Greenwich Public Schools will secure the building permit(s) and upon award of the Contract they will be transferred to the awarded contractor / vendor. No cost should be included in the base bid for the building permit.
- H. WAGES: All work shall be done in accordance with applicable State statutes; conditions of Prevailing Wages shall apply where required by State of CT DAS, projects over \$100,000. Prevailing Wage Schedule provided herein is for demonstrable purposes only. It is the responsibility of the bidder / vendor to verify actual rates.
- I. COLLUSION AMONG BIDDERS:
1. More than one offer from an individual, firm, partnership, corporation, or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder is interested in more than one bid for the work contemplated will cause rejection of all bids in which the bidder is interested. Any or all bidders will be rejected if there is any reason for believing that collusion exists among the bidders.
 2. Participants in such collusion may not be considered in the future offers for the same work. Each bidder, by submitting a bid, certifies that it is not part to any collusive action.
 3. Each bid shall be accompanied by a completely filled in and properly executed **Non- Collusive Affidavit**, provided.
- J. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED: The successful bidder will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or nation origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The successful bidder agrees to post in a conspicuous place, available to employees and applicants for employment, notices setting forth the provision of this nondiscrimination clause. The successful bidder in all solicitations or advertisements for employment, placed by or on behalf of the contractor, will state that such successful bidder in an EQUAL OPPORTUNITY EMPLOYER.
- K. QUALIFICATIONS: No qualifications to the bid are allowed. If bids are qualified, they may be deemed non-responsive and subsequently rejected.
- L. No Bidder may withdraw their Bid within 90 days after the actual date of Bid Opening.
- M. COPIES: Failure to submit a bid with four copies does not constitute a material defect.
- N. BID EVALUATION: A committee composed of various administrators will evaluate bids. The following criteria guidelines will be used in analyzing and evaluating this bid:
1. Conformance to the requirements of this bid, i.e. conformance to Terms, Conditions and Scope of Work.
 2. Proven skills and technical competence.
 3. Background of the firm.
 4. For Vendor firm, identification of all personnel who will have a principal responsibility.
 5. The Board of Education may consider proximity of the vendor's service as a factor in determining lowest responsible bid. Companies must be located within 60 miles of

the School District in order to submit a bid.

6. The Board of Education shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the Board of Education with information and data for this purpose as the Board of Education may request. The right is reserved to reject any bid where, on investigation, the evidence or information submitted by such bidders does not satisfy the Board of Education that the bidder is qualified to carry out properly the terms of the Contract.
 7. Apparent low bidder agrees to submit the following Supplements to Greenwich Public Schools within 48 hours after submission of the Bid for consideration in award of the Contract:
 - a. Subcontractors; Include the names of all Subcontractors and the portions of the Work they will perform.
 - b. Cost Breakdown identifying the Bid Price/Sum segmented into portions as requested, broken down per school building. (Schedule of Values)
 - O. AWARD: The Contract shall be awarded to the lowest responsible and qualified bidder, meaning the bidder whose bid is the lowest of those bidders possessing the skill, ability, and integrity necessary to faithfully perform the work based on objective criteria considering past performance and financial responsibility. In considering past performance, the Greenwich Public Schools shall evaluate the skill, ability, and integrity of bidders in terms of the bidders' fulfillment of contract obligations and all the bidders' experience or lack of experience with projects of similar size and scope. The Greenwich Public Schools reserves the right to consider as unqualified to do the work required by the bid documents any bidder that does not habitually perform with its own forces the major portion of the work involved in the bid documents. No contract will be awarded to any bidder who is at time of award not qualified under applicable regulations issued by the Secretary of Labor, United States of Department of Labor, or any applicable State and local laws and regulations.
 - P. REJECTION: after review of all sectors, terms, and conditions, including price, Greenwich Public Schools reserves the right to reject any and all bids, or any part thereof, or waive defects in same.
 - Q. Any bid may be withdrawn prior to the opening time and date. Any bids received after the specified time and date will not be considered.
- 1.5 BIDDER QUALIFICATIONS:
- A. Companies must be located within 60 miles of the School District in order to submit a bid.
 - B. Companies submitting a bid must be in business under the same corporate name for a minimum of five (5) years.
 - C. Contractor must have the resources to complete the scope of work for this project with a minimum of 50% of their own workforce.
 - D. Non-Connecticut Contractors: Pursuant to Connecticut General Statutes §12-430(7), as amended by Public Act No. 11-61, Section 66, a non-resident contractor shall comply with the State of Connecticut's bonding requirements.

1.6 CONTRACT:

- A. SINGLE PRIME CONTRACT will be let for:
1. General Construction
 2. Bid awards must be approved by the Greenwich Public Schools. All contractors shall be required to execute the Greenwich Public Schools standard form of Contract and accompanying Payment & Performance Bonds without exception.
- B. LENGTH: This bid is for awarding the contract to cover the period outlined in the Milestone Schedule. Once this Bid is awarded, successful bidder must make arrangements to meet with Greenwich Public Schools as required. In the event that the work is not substantially complete on the date identified in the Milestone Schedule, liquidated damages will be in effect at \$500 per calendar day and if all work is not final complete as scheduled, the liquidated damages will increase to \$2,500 per calendar day.
- C. AWARD OF CONTRACT: The contract will be awarded by the Board of Education to a qualified firm or person at compensation determined to be fair and reasonable considering budgetary limitations, scope, complexity, and the nature of goods and/or services.
1. If there is a conflict between the Contract Agreement and the General Conditions, the Contract Agreement shall prevail.
 2. The successful bidder will produce for the Greenwich Public Schools review, a current financial statement, which will remain strictly confidential.
- D. The contractor shall simultaneously with the signing of the Contract, furnish the Town the executed Performance, Maintenance, and Payment Bond of a surety company authorized to do business the State of Connecticut, and acceptable to the Town, in the sum of all the full amount of the Contract Obligation in the form provided by the Town. The Performance Bond will not be required where the total estimated cost of labor and materials under the contract with respect to which such general bid is submitted is less than one hundred thousand dollars (\$100,000). Once a contract exceeds \$100,000 the bidder will be responsible for obtaining and paying for all bonds required by Greenwich Public Schools.
- E. Within 60 calendar days of award of the Contract, the contractor shall obtain Employee Background Checks as imposed by Section 2 of Public Act 16-67, which amended Connecticut General Statute 10-222c. Refer to attached forms following the Instructions to Bidders which must be completed for the Employee Background Checks.
- F. PAYMENTS: The Greenwich Public Schools reserves the right to provide payment in accordance with completion of services based on the Project Schedule.

PART 2 - PRODUCTS (Not Applicable)**PART 3 - EXECUTION**

3.1 PROVISIONS:

- A. Consumption or use of alcohol and / or drugs is prohibited on school property. Any individual with alcohol or drugs will be removed from said property and will not be allowed to work on the project. Smoking is prohibited in all school buildings and on school grounds.
- B. Greenwich Public Schools reserves the right to reject any proposed subcontractor for reasonable cause.

END OF SECTION 00 0301

**APPLICANT BACKGROUND CHECK FORM
("Form A-1")**

Directions: Each local or regional board of education, governing council of a state or local charter school, and interdistrict magnet school operator is required by Connecticut law to obtain the information requested in this form from any applicant who applies for a position of employment with such local or regional board of education, council, or operator, if the position for which the applicant is applying would cause the applicant to have direct student contact. No local or regional board of education, council, or operator may employ an applicant for a position involving direct student contact who does not provide the information requested in this form. Accordingly, please complete this form and return it to [CONTACT PERSON] promptly so that your application may be processed.

Section A -- Current and Former Employers

Directions: Each local or regional board of education, governing council of a state or local charter school, and interdistrict magnet school operator is required by Connecticut law to conduct a review of your employment history with each of your current or former employers if: (a) such current or former employer was a local or regional board of education, governing council of a state or local charter school, or interdistrict magnet school operator, or (b) such employment otherwise caused you to have contact with children. Such review must be conducted using the State of Connecticut Educational Employer Verification Form ("Form A-2"), attached to this form.

Accordingly, please complete the table below (using an additional sheet of paper as needed), and then sign at the bottom of this section. For each employer listed in the table below, please complete Section 1 of Form A-2, using a separate Form A-2 for each employer. Please return the completed Form A-2(s) to [CONTACT PERSON] promptly so that your application may be processed.

<u>Employer Name</u>	<u>Employer Address</u>	<u>Employer Telephone #</u>

By signing below, I am affirming that the information provided above is true and correct. I understand that if I knowingly provide false information or knowingly fail to disclose the information requested herein, I shall be subject to discipline by [BOARD/COUNCIL/OPERATOR] that may include (1) denial of employment or (2) termination of my employment contract, in accordance with the provisions of Connecticut General Statutes Section 10-151.

Employee Signature: _____

Date: _____

Directions for School District/Entity Considering Applicant for Employment: Each local or regional board of education, governing council of a state or local charter school or an interdistrict magnet school operator is required to obtain the information listed on this form from ALL current or former employer(s) of the applicant if such employer was a local or regional board of education, a governing council of a state or local charter school, an interdistrict magnet school operator or if the employment caused the applicant to have contact with children. Applicants are required under the law to provide a prospective employer with the name, address and telephone number of all current or former employers that meet the above criteria. Information may be collected either through a written communication or telephonically.

Directions for Current/Previous Employer: The applicant listed below is under consideration for a position with the school/district listed below in Section 2. The individual identified below has reported current/previous employment with your organization or contractual services with your organization in a position in which he/she had contact with children. As required by Connecticut General Statutes Section 10-222c, as amended by Public Act 16-67, please provide the information requested in Section 3. In accordance with the provisions of Public Act 16-67, you are required to respond to this request within five business days.

Section 1 – To be completed by the Applicant

Name of applicant	
Former name(s) (if applicable)	
Street address	
City, State, Zip Code	
Approximate dates of employment with employer listed in Section 3 of this form	
Position held with employer listed in Section 3 of this form	

Section 2 – To be completed by the Prospective Employer

Name of prospective employer	
Street address of prospective employer	
City, State, Zip Code	
Contact person	
Telephone number/email address	

Section 3 – To be completed by the Current/Former Employer

Name of employer	
Date of receipt of this notice	
Date of employment of above named applicant	
Contact person	
Telephone number/email address	

To your knowledge, has the Applicant ever:

Yes ☐ No ☐ Been the subject of an allegation of abuse or neglect or sexual misconduct for which there is an investigation currently pending with any current or prior employer, state agency or municipal police department or which has been substantiated?

Yes ☐ No ☐ Been disciplined or asked to resign from employment or resigned from or otherwise separated from any employment while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct?

Yes ☐ No ☐ Had a professional or occupational license, certificate, authorization or permit suspended or revoked or ever surrendered such a license, certificate, authorization or permit while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct?

Signature of Superintendent or HR Director

Date

Return all completed information to the Prospective Employer listed in Section 2 of this form.

NOTES:

The terms provided below are currently defined in state law as follows. Please note that statutes may be amended from time to time.

Sexual Misconduct – “any verbal, nonverbal, written or electronic communication, or any other act directed toward or with a student that is designed to establish a sexual relationship with the student, including a sexual invitation, dating or soliciting a date, engaging in sexual dialog, making sexually suggestive comments, self-disclosure or physical exposure of a sexual or erotic nature and any other sexual, indecent or erotic contact with a student.” Connecticut General Statutes § 10-222c(k).

Abuse or neglect – “abuse or neglect as described in Section 46b-120, and includes any violation of Sections 53a-70, 53a-70a, 53a-71, 53a-72a, 53a-72b or 53a-73a.” Connecticut General Statutes § 10-222c(k).

Section B

Directions: Please review the information in this Section B, and then indicate your agreement with the Information by signing below.

1. I hereby consent to and authorize disclosure of the following information, and release of related records, by the employers listed in Section A of this form (together the "Employers" and individually an "Employer"):
 - a. The dates of my employment with the Employer.
 - b. A statement as to whether the Employer has knowledge that I:
 - i. was the subject of an allegation of abuse or neglect or sexual misconduct for which there is an investigation pending with any employer, state agency, or municipal police department, or which has been substantiated;
 - ii. was disciplined or asked to resign from employment, or resigned from or otherwise separated from any employment, while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct; or
 - iii. have ever had a professional or occupational license, certificate, authorization, or permit suspended or revoked, or have ever surrendered such a license, certificate, authorization, or permit, while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct.
 - c. More information concerning any response made by any Employer to the request for information and records described in parts (a) and (b) of this Section B.1 of this form.
2. I hereby consent to and authorize disclosure of the following information, and release of related records, by the Department of Education (the "Department"):
 - a. Information concerning my eligibility status for employment.
 - b. A statement as to whether the Department has knowledge that a finding has been substantiated by the Department of Children and Families pursuant to Conn. Gen. Stat. § 17a-101g of abuse or neglect or of sexual misconduct against me, and any information concerning such a finding.
 - c. A statement as to whether the Department has received notification that I have been convicted of a crime or of criminal charges pending against me, and any information concerning such charges.
3. I hereby release the Employers and the Department from liability that may arise from the disclosure or release of records which I have authorized and to which I have consented in Sections B.1 and B.2 of this form.

Employee Signature: _____

Date: _____

Section C

Directions: Please answer the questions below in their entirety, and then sign below. For purposes of these questions, the following definitions apply:

- "Sexual misconduct" means any verbal, nonverbal, written, or electronic communication, or any other act directed toward or with a student that is designed to establish a sexual relationship with the student, including a sexual invitation, dating, or soliciting a date, engaging in sexual dialog, making sexually suggestive comments, self-disclosure, or physical exposure of a sexual or erotic nature, and any other sexual, indecent, or erotic contact with a student.
- "Abuse or neglect" means abuse or neglect as described in Conn. Gen. Stat. § 46b-120, and includes any violation of Conn. Gen. Stat. § 53a-70 (sexual assault in the first degree), § 53a-70a (aggravated sexual assault in the first degree), § 53a-71 (sexual assault in the second degree), § 53a-72a (sexual assault in the third degree), § 53a-72b (sexual assault in the third degree with a firearm), or § 53a-73a (sexual assault in the fourth degree).

Y N Have you ever been the subject of an abuse or neglect or sexual misconduct
☐ investigation by any employer, state agency, or municipal police department (answer
"no" if the investigation resulted in a finding that all allegations were unsubstantiated)?

Y N Have you ever been disciplined or asked to resign from employment or resigned from or
☐ otherwise separated from any employment while an allegation of abuse or neglect was
pending or under investigation by the Department of Children and Families ("DCF"), or
an allegation of sexual misconduct was pending or under investigation or due to an
allegation substantiated pursuant to Conn. Gen. Stat. § 17a-101g of abuse or neglect,
or of sexual misconduct or a conviction for abuse or neglect or sexual misconduct?

Y N Have you ever had a professional or occupational license or certificate suspended or
☐ revoked, or have you ever surrendered such a license or certificate while an allegation
of abuse or neglect was pending or under investigation by DCF or an investigation of
sexual misconduct was pending or under investigation, or due to an allegation
substantiated by DCF of abuse or neglect or of sexual misconduct, or a conviction for
abuse or neglect or sexual misconduct?

Y N Have you ever been convicted of a crime (answer "no" if you have been the subject of
☐ any arrest, criminal charge, or conviction, the records of which have been erased)?

Y N
☐ Are criminal charges pending against you?

Y N Are you disqualified from employment with [NAME OF
☐ BOARD/COUNCIL/OPERATOR]?
☐

By signing below, I am affirming that the information provided above is true and correct. I understand that if I knowingly provide false information or knowingly fail to disclose the information requested herein, I shall be subject to discipline by the [BOARD/COUNCIL/OPERATOR] that may include (1) denial of employment or (2) termination of my employment contract, in accordance with the provisions of Connecticut General Statutes Section 10-151.

Employee Signature: _____

Date: _____

ACKNOWLEDGEMENTS REGARDING OFFER OF EMPLOYMENT
("Form A-3")

Please sign and return one copy of this form to [CONTACT PERSON]. An additional copy is enclosed for your reference.

1. I hereby acknowledge and confirm that my employment with the [BOARD/COUNCIL/OPERATOR] is on a temporary basis for a period not to exceed ninety (90) days, pending a review by the [BOARD/COUNCIL/OPERATOR] of (a) the information I provided in the attached Employee Background Form ("Form A-1"), and (b) information and records provided by the employers listed in Section A of Form A-1 and the Department of Education, the disclosure and release of which I have authorized and to which I have consented in Section B of Form A-1.
2. I understand and acknowledge that I must submit to a records check of the Department of Children and Families child abuse and neglect registry established pursuant to Conn. Gen. Stat. § 17a-101k before I may be hired by the [BOARD/COUNCIL/OPERATOR]. I further understand and acknowledge that, if warranted by the results of this records check and any additional information I may provide in response to the results of such check, the [BOARD/COUNCIL/OPERATOR] shall terminate my employment.
3. I understand and acknowledge that I must submit to state and national criminal history records checks within thirty (30) days from the date of my employment with the [BOARD/COUNCIL/OPERATOR]. I further understand and acknowledge that decisions regarding the effect of a conviction on my further employment with the [BOARD/COUNCIL/OPERATOR] will be made on a case-by-case basis. I further understand and acknowledge that if the [BOARD/COUNCIL/OPERATOR] receives notice of a conviction of a crime which I have not previously disclosed to the [BOARD/COUNCIL/OPERATOR], the [BOARD/COUNCIL/OPERATOR] may terminate my employment contract in accordance with the provisions of Conn. Gen. Stat. § 10-151.
4. I understand and acknowledge that if I knowingly provide false information or knowingly fail to disclose the information requested in Form A-1, I shall be subject to discipline by the [BOARD/COUNCIL/OPERATOR] that may include (a) denial of employment or (b) termination of my employment contract in accordance with the provisions of Conn. Gen. Stat. § 10-151.

Signature _____

Date _____

SECTION 000400 BID FORM

AUDITORIUM AC UPGRADE – WESTERN MIDDLE SCHOOL

The undersigned hereby proposes to furnish all labor, materials, devices, appliances, supplies, equipment, services and other facilities necessary to complete all of the work of the above referenced Contract, as required by, and in accordance with, the provisions of the Instructions to Bidders, the Conditions of the Contract, the Drawings and Specifications, all as prepared by AKF Engineers and dated **November 13, 2020**; and that, if this Proposal is accepted, the Undersigned agrees to enter into an Agreement with the Owner to perform this work for the sum(s) as follows:

SUBMITTED BY: _____

Bidder's Full Name _____

Address _____

City, _____ State, _____ Zip _____

1.1 **BASE BID: WESTERN MIDDLE SCHOOL**

- A. **BASE BID:** The Base Bid of this proposal for all work required by the Contract Documents for **Auditorium AC Upgrade at Western Middle School** and Related Work:

_____ (\$ _____) DOLLARS

1.2 **ACCEPTANCE:**

- A. If this bid is accepted by Greenwich Public Schools within the time period stated above, we will:
1. Execute the Agreement within seven days of receipt of Notice of Award.
 2. Furnish the required bonds within seven days of receipt of Notice of Award.
- B. If this bid is accepted within the time stated, and we fail to commence the Work or we fail

to provide the required Bond(s), the security deposit shall be forfeited as damages to Greenwich Public Schools by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

1.3 CONTRACT TIME:

- A. The Undersigned agrees in the Base Bid to complete the work as per the Milestone Schedule provided in the Specifications.

1.4 ADDENDA:

- A. The following Addenda have been received. The modifications to the Bid Document noted below have been considered and all costs are included in the Bid Sum.

1. Addendum# _____ Date _____.
2. Addendum# _____ Date _____.
3. Addendum# _____ Date _____.
4. Addendum# _____ Date _____.
5. Addendum# _____ Date _____.

1.5 BIDDER'S FURTHER AFFIRMATION AND DECLARATION

- A. The above name bidder and should this bid be a joint bid each party thereto, further affirm and declares;
1. That said bidder is of lawful age and the only one interested in this bid; and that no other person, firm or corporation, except those herein above names has any interest in this bid or in the contract proposed to be entered into.
 2. That said bidder is not in arrears to the Greenwich Public School upon debt or contract, and is not a defaulter, as surety or otherwise upon any obligation to the Greenwich Public Schools.
 3. That no member of the Greenwich Public Schools or any officer or employee of the Greenwich Public School or person whose salary is payable in whole or in part from the School District treasury, or the spouse of any foregoing is or shall be or become interested, directly or indirectly, as a contracting party, partner, stockholder, surety or otherwise, in this bid, or in the performance of the Contract, or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof.
 4. That he/she has carefully examined the site of the work and that, from his / her own investigations, he/ she has satisfied him/ herself as to the nature and location of the work, and character, quality and quantity of material, and all difficulties likely to be encountered, the kind and extent of equipment and other facilities needed for

the performance of the work, the general and local conditions, and all other items which may, in any way, effect the work or its performance.

5. That if a corporation, this bid or proposal containing the Non-Collusive Binding Certification and the foregoing Affirmation and Declaration has been authorized by the Board of Directors of such Corporation, which authorization includes the signing and submission of this bid or proposal and the inclusion therein of the said Certificate of Non-Collusion and Affirmation and Declaration as the Act and Deeds of the Corporation.

1.6 **BID FORM SIGNATURE(S)**

Signature Corporate Seal

Company Name: _____

was hereunto affixed in the presence of:

Subscribed and sworn before me this day of _____ 2019

Notary Public: _____

My Commission Expire: _____

END OF SECTION 000400

SECTION 000410 - CONTRACTOR'S QUALIFICATION STATEMENT

With the submittal of the Bid Proposal Form (Section 00 0400), the bidder shall attach this Contractor's Qualification Statement and shall answer the Questions herein. Failure to answer these questions in full may be cause for rejection of the bidder's proposal. **If more space is needed, please attach other sheets with reference to subject paragraph.**

The Board of Education reserves the right to consider, but not limited to, the financial responsibility, experience and reputation in the construction industry, as well as the specific qualifications listed below and elsewhere in this document in considering bids and awarding the contract. The Board of Education reserves the right to waive any informalities if, at its discretion the interest of the Greenwich Public Schools will be better served.

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO: **Greenwich Public Schools**

ADDRESS: **290 Greenwich Avenue, Greenwich, CT 06830**

SUBMITTED BY: Corporation

NAME Partnership

ADDRESS: Individual

PRINCIPAL OFFICE Other

NAME OF PROJECT: **Western Middle School: Auditorium AC Upgrade**

TYPE OF WORK (file separate for each Classification of Work)

_____General Construction

_____HVAC

_____Plumbing

_____Electrical

_____Other

1.1 ORGANIZATION

- A. How many years has your organization been in business as a Contractor?
- B. How many years has your organization been in business under its present business name?
 - 1. Under what other or former names has your organization operated?
- C. What is the firm's bonding range?
 - 1. Single
 - 2. Aggregate
- D. If your organization is a corporation, answer the following:
 - 1. Date of Incorporation:
 - 2. State of Incorporation:
 - 3. President's name:
 - 4. Vice-president's name(s):
 - 5. Secretary's name:
 - 6. Treasurer's name:
- E. If your organization is a partnership, answer the following:
 - 1. Date of organization:
 - 2. Type of partnership (if applicable):
 - 3. Name(s) of general partner(s):
- F. If your organization is individually owned, answer the following:
 - 1. Date of organization:
 - 2. Name of owner:
- G. If the form of your organization is individually owned, answer the following:
 - 1. If the form of your organization is other than those listed above, describe it and name the principals:

1.2 OWNERSHIP, MANAGEMENT, AFFILIATION

- A. Identify each person who is or has been within the past five years, an owner of 5.0% or more of the firm's shares, one of the five largest shareholders, a director, an officer, a partner or the proprietor, or a managerial employee.

First Name	MI	Last Name	DOB	% Owned	Director Y or N	Officer Y or N	Title	Partner Y or N

- B. Joint Ventures: Provide information for all firms involved. Fill in name, % owned, office held; indicate by Y or N whether director, officer, partner and title.

First Name	MI	Last Name	DOB	% Owned	Director Y or N	Officer Y or N	Title	Partner Y or N

- C. Identify any other firms in which now or in the past five years, the firm or any of the individuals listed in questions 1.2.A and 1.2.B above, either owned or owns 5.0% or more of the shares of or was or is one of the five largest shareholders, a director, an officer, a partner or a proprietor of said other firm. _____ Yes, list below _____ No

Federal ID No.	% Owned	Firm/Company Name: Position	Company Address

- D. Has the firm or any firm listed in response to questions above defaulted or been terminated and its surety called upon to complete, any contract awarded within the past five years (

) Yes, () No. If yes, give date(s), agency(ies)/owner(s), project(s), contract numbers, and describe including the result:

- E. List below any projects performed by the bidder in the past five (5) years on which any of the following events occurred:

1. Were any extension of time requested by the contractor, and were such requests granted?
2. Was litigation and/or arbitration commenced by either the Owner or the bidder as a result of the work of the project performed by the bidder?
3. Were any liens filed on the project by subcontractors or material suppliers of the bidder?
4. Did the bidder make any claims for extra work on the project, and did said claim result in a change order?

<u>Project</u>	<u>Type of Event</u>	<u>Name/Address of Owner</u>	<u>Name & Phone # of Contact Person at Owner</u>
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- F. For **all** contracts within the past five years: (a) List all liens or claims over \$25,000 filed against the firm and remaining undischarged or unsatisfied for more than 90 days; and (b) list and describe all liquidated damages assessed.

1.3 FINANCIAL INFORMATION

- A. Provide a copy of the firm's most recent annual financial statement.

1.4 OTHER INFORMATION

- A. Within the past five years has the firm, any affiliate, any predecessor company or entity or any person identified in questions number 1.1 through 1.2 above been the subject of any of the following: (Respond to each question and describe in detail the circumstances of each affirmative answer: (Attach additional pages if necessary).

1. A judgment of conviction for any business-related conduct constituting a crime under state or federal law. No _____ Yes _____
2. A criminal investigation or indictment for any business-related conduct constituting a crime under state or federal law? No _____ Yes _____
3. An order of protection filed against an officer or employee prohibiting access to jobsite(s) or prohibiting contact with any staff of any owner? No _____ Yes _____
4. A grant of immunity for any business-related conduct constituting a crime under state and federal law? No _____ Yes _____

5. A federal or state suspension or debarment? No_____ Yes_____
6. A rejection of any bid for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? No_____ Yes_____
7. A rejection of any proposed subcontract for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? No_____ Yes_____
8. A denial or revocation of prequalification? No_____ Yes_____
9. A voluntary exclusion from bidding/contracting agreement? No_____ Yes_____
10. Any administrative proceeding or civil action seeking specific performance or restitution in connection with any public works contract except any disputed work proceeding? No_____ Yes_____
11. An OSHA Citation and Notification of Penalty containing a violation classified as serious? No_____ Yes_____
12. An OSHA Citation or Notification of Penalty containing a violation classified as willful? No_____ Yes_____
13. A prevailing wage or supplement payment violation? No_____ Yes_____
14. A State Labor Law violation deemed willful? No_____ Yes_____
15. Any other federal or state Citations, Notices, violation orders, pending administrative hearings or proceedings or determinations of a violation of any labor law or regulation? No_____ Yes_____
16. Any criminal investigation, felony indictment or conviction concerning formation of or any business association with, an allegedly false or fraudulent women's, minority or disadvantaged business enterprise? No_____ Yes_____
17. Any denial, decertification, revocation or forfeiture of Women's Business Enterprise, Minority Business Enterprise or Disadvantaged Business Enterprise status? No_____ Yes_____
18. Rejection of a low bid on a State contract for failure to

m

meet statutory affirmative action M/WBE requirements? No _____ Yes _____

19. A consent order with the CT Department of Environmental Protection or a federal, state or local government enforcement determination involving a violation of federal or state environmental laws? No _____ Yes _____

20. Any bankruptcy proceeding? No _____ Yes _____

21. Any suspension or revocation of any business or professional license? No _____ Yes _____

22. Any citations, notices, violation orders, pending administrative hearings or proceedings or determinations for violation of: No _____ Yes _____

a. Federal, state or local health laws, rules or regulations . No _____ Yes _____

b. Federal, state or local environmental laws, rules and regulations. No _____ Yes _____

c. Unemployment insurance or workers compensation coverage or claim requirements. No _____ Yes _____

d. ERISA (Employee Retirement Income Security Act). No _____ Yes _____

e. Federal, state or local human rights laws. No _____ Yes _____

f. Federal or state security laws. No _____ Yes _____

g. Withdrawal or an agreement to withdraw a bid submitted to a public owner or a request by a public owner to withdraw a bid? No _____ Yes _____

B. During the five year period preceding the submissions of this bid, has the bidder been named as a part in any lawsuit in an action involving a claim for personal injury or wrongful death arising from performance of work related to any project in which it has been engaged? If the answer to this question is yes, list all such lawsuits, the index number associated with said suit and the status of the lawsuit at the time of the submission of this bid.

No _____ Yes _____

C. During the five year period preceding the submission of this bid, has the bidder been the subject of proceedings before the Department of Labor for alleged violations of the Labor Law as it relates to the payment of prevailing wages and/or supplemental payment requirements? If the answer to this question is yes, please list each such instance of the commencement of a Department of Labor proceeding, for which project such proceeding was commenced, and the status of the proceeding at the time of the submission of this bid.

**GREENWICH PUBLIC SCHOOLS
WESTERN MIDDLE SCHOOL
AUDITORIUM AC UPGRADE**

No _____ Yes _____

- D. During the five year period preceding the bidder's submission of this bid, has the bidder been the subject of proceedings involving allegations that it violated the Worker's Compensation Law including but not limited to the failure to provide proof of worker's compensation or disability coverage and/or any lapses thereof. If the answer to this question is yes, list such instance of violation and the status of the claimed violation at the time of disposition of this bid.

No _____ Yes _____

- E. Has the bidder, its officers, directors, owner and/or managerial employees been convicted of a crime or been the subject of a criminal indictment during the five years preceding the submission of this bid? If the answer to this question is yes, list the name of the individual convicted or indicted the charge against the individual and the date of disposition of the charge.

No _____ Yes _____

- F. During the five year period preceding the bidder's submission of this bid, has the bidder been charged with and/or found guilty of any violations of federal, state, or municipal environmental and/or health laws, codes, rules and/or regulations. If the answer to this question is yes, list the nature of the charge against the bidder, the date of the charge, and the status of the charge at the time of the submission of this bid.

No _____ Yes _____

- G. Has the bidder ever defaulted or had its surety called upon to complete any contract awarded within the past five years. If the answer to this question is yes, list the projects, the dates and the nature of the termination (convenience, suspension, for cause).

No _____ Yes _____

- H. Has any officer or partner of the bidder's organization ever defaulted or had its surety called upon to complete any contract awarded within the past five years or been an officer or partner of some other organization that has been terminated from a project by an owner? If yes, state

No _____ Yes _____

Name of
Individual(s)

Name of
Organization(s)

Reason(s)

1.5 LICENSING

- A. List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration of license numbers, if applicable.
- B. List jurisdictions in which your organization's partnership or trade name is filed:
- C. Has any director, officer, owner or managerial employee had any professional license suspended or revoked? If the answer is yes, list the name of the individual, the professional license he/she formally had, whether the license was revoked or suspended and the date of the revocation or suspension

No _____ Yes _____

1.6 EXPERIENCE

- A. List the categories of work that your organization will perform with its own forces:
- B. Claims and Suits. (If the answer of any of the questions below is yes, please attach details.)
 - 1. Have you or has any director, officer, owner or managerial employee ever failed to complete any work awarded to them? If yes, list the project(s) the date(s) and the reason(s) for the failure to complete.

No _____ Yes _____
 - 2. Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

No _____ Yes _____
 - 3. Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

No _____ Yes _____
- C. Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

No _____ Yes _____
- D. On a separate sheet, list **all** similar construction projects your organization has in progress or completed, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

1. State total worth of work in progress and under contract:
- E. On a separate sheet, list **all** projects, not listed above, that your organization has completed or in progress in the past five years, giving the name of the project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.
 1. State average annual amount of construction work performed during the past five years:
- F. On a separate sheet, list the construction experience and present commitment of the key individuals of your organization.

1.7 REFERENCES

- A. Trade reference:
- B. Bank references:
- C. Surety:
 1. Name of present bonding company:
 2. Name and address of agent:
 3. Name or previous bonding company:

1.8 CERTIFICATION

- A. The undersigned recognizes that this questionnaire is submitted for the purpose of the Greenwich Public Schools (Owner) to award a contract or approve a subcontract; acknowledges that the Owner may in its discretion, by means which it may choose, determine the truth and accuracy of all statements made herein; acknowledge that intentional submission of false or misleading information may constitute a felony, or a misdemeanor, and may also be punishable by a fine or imprisonment; and states that the information submitted in this questionnaire and any attached pages is true, accurate and complete.

Dated at this day of _____

Name of Organization:

By:

Title:

AKF # 190911-000

**GREENWICH PUBLIC SCHOOLS
WESTERN MIDDLE SCHOOL
AUDITORIUM AC UPGRADE**

SWORN AND SUBSCRIBED TO BEFORE ME, A NOTARY PUBLIC, IN AND FOR

THE COUNTY OF _____ AND THE STATE OF _____

THIS _____ DAY OF _____, 2020

**NOTARY
PUBLIC**

MY COMMISSION EXPIRES _____

END OF SECTION 000410

SECTION 000460 - NON-COLLUSIVE AFFIDAVIT

**GREENWICH PUBLIC SCHOOLS
290 GREENWICH AVE
GREENWICH, CONNECTICUT**

State of _____:

County of _____:s.s.

I state that I am the _____ of _____
(TITLE) (NAME OF MY FIRM)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

- (1) The price(s) and amount of this bid have been arrived at independently and without consultation communication or agreement with any other contractor, bidder/proposer or potential bidder/proposer.
- (2) Neither the price(s) nor the amount of this BID/RFP, and neither the approximate price(s) nor approximate amount of this BID/RFP, have been disclosed to any other firm or person who is a bidder/proposer or potential bidder/proposer, and they will not be disclosed before BID/RFP opening.
- (3) No attempt has been made or will be made to induce any firm or person to refrain from bidding/proposing on this contract, or to submit a bid/proposal higher than this BID/RFP, or to submit any intentionally high or noncompetitive BID/RFP or other form of complementary BID/RFP.
- (4) I fully understand that more than one offer from an individual, firm partnership; corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder/proposer is interested in more than one BID/RFP for the work contemplated may cause rejection of all BID/RFP in which the bidder/proposer is interested. Any or all bidders/proposers will be rejected if there is any reason for believing that collusion exists among the bidders/proposers. Participants in such collusion may not be considered in the future offers for the same work. Each bidder/proposer by submitting a bid/proposal certifies that it is not a part to any collusive action.
- (5) The BID/RFP of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid/proposal.

- (6) _____ its affiliates, subsidiaries, officers, directors (NAME OF MY FIRM)

and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding/proposing on any public contract, except as follows:

state that _____ understands and acknowledges that the above
(NAME OF MY FIRM)

representations are material and important, and will be relied on by Greenwich Public Schools in awarding the bid/proposal for which this is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Greenwich Public Schools of the true facts relating to the submission of BID/RFP for this contract.

- (7) I agree deliver all services on the date and time agreed on by

_____ and the
(NAME OF MY FIRM)

Greenwich Board of Education. Furthermore, there will not be any cancellations to the Board of Education. If a bidder/proposer submits a bid/proposal on any item he/she will be responsible for delivering that item at the bid/proposal cost, in accordance with the attached above specifications, which were submitted with this bid/proposal and upon which the bid/proposal was made.

- (8) In submitting this bid/proposal, the undersigned declares that this is made without any connection with any persons making another bid/proposal on the same contract; that the bid/proposal is in all respects fair and without collusion, fraud or mental reservation; and that no official of the Town, or any person in the employ of the Town, is directly or indirectly interested in said bid/proposal or in the supplies or work to which it relates, or in any portion of the profits thereof.
- (9) In submitting this bid, the undersigned further declares that it has not, and will not, induce or attempt to induce any Town of Greenwich employee or officer to violate the Greenwich Code of Ethics in connection with its offer to provide goods or services under, or otherwise in the performance of such contract.
- (10) The undersigned further understands that the above declarations are material representations to the Town of Greenwich made as a condition to the acceptance of the bid/proposal. If found to be false, the Town of Greenwich retains the right to reject said bid/proposal and rescind any resultant contract and/or purchase order and notify the undersigned accordingly, thereby declaring as void said bid/proposal and contract or purchase order.
- (11) The Greenwich Code of Ethics can be found at **www.greenwichct.org** Code of Ethics stated as follows:

A. DEFINITIONS.

1. Indirect interest, without limiting its generality, shall mean and include the interest of any subcontractor in any prime contract with the Town and the interest of any person or his immediate family in any corporation, firm or partnership which as a direct or

indirect interest in any transaction with the Town.

2. Substantial financial interest shall mean any financial interest, direct or indirect, which is more than nominal and which is not common to the interest of other citizens of the Town.
3. Town Officer shall mean and include any official, commission, committee, legislative body or other agency of the Town.
4. Transaction shall mean and include the offer, sale or furnishing of any real or personal property, material, supplies otherwise, for the use and benefit of the Town for a valuable consideration, excepting the services of any person as a Town Officer.

B. GIFTS AND FAVORS. No Town Officer or his immediate family shall accept any valuable gift, things, favor, loan or promise which might tend to influence the performance or non- performance of his official duties.

C. IMPROPER INFLUENCE. No Town Officer having a substantial financial interest in any transaction with the Town or in any action to be taken by the Town shall use his office to exert his influence or to vote on such transaction or action.

By signing this proposal the proposer understands and agrees to the attached terms, conditions, and specifications, including Collusion among Proposers. Employment Discrimination by the Contractor Prohibited.

VENDOR INFORMATION: (Please print the following)

Vendor Name

Address

Telephone

Fax #

E-MAIL

WEB SITE

PRINTED NAME & SIGNATURE

TITLE

SWORN AND SUBSCRIBED TO BEFORE ME, A NOTARY PUBLIC, IN AND FOR

THE COUNTY OF _____ AND THE STATE OF _____

THIS _____ DAY OF _____, 2020

**NOTARY
PUBLIC**

MY COMMISSION EXPIRES _____

END OF SECTION 000460

**Minimum Rates and Classifications for
Building Construction**

ID#: 20-17578

**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: Greenwich

Project Town: Greenwich

State#: Greenwich

FAP#: Greenwich

Project: Auditorium AC Upgrades at Western Middle School (Greenwich)

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	42.07	30.99
2) Boilermaker	38.34	26.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	35.71	34.34 + a
3b) Tile Setter	34.9	25.87
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.7	21.75
3e) Plasterer	33.48	32.06
-----LABORERS-----		
4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	31.0	22.15
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	31.25	22.15

Project: Auditorium AC Upgrades at Western Middle School (Greenwich)

4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	31.5	22.15
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.	32.0	22.15
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	31.75	22.15
4e) Group 6: Blasters, nuclear and toxic waste removal.	34.0	22.15
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	32.0	22.15
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	29.28	22.15
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	28.74	22.15
4i) Group 10: Traffic Control Signalman	18.0	22.15
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.	34.53	25.64
5a) Millwrights	34.94	26.19
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)	40.0	36.15
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	55.12	34.765+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)	39.18	22.55 + a

9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	37.62 + a
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----OPERATORS----

Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	42.45	25.30 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	42.11	25.30 + a
Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	41.32	25.30 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	40.91	25.30 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	40.28	25.30 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	40.28	25.30 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	39.95	25.30 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	39.59	25.30 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	39.17	25.30 + 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).	38.71	25.30 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	36.54	25.30 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	36.54	25.30 + a

Group 12: Wellpoint operator.	36.48	25.30 + a
Group 13: Compressor battery operator.	35.86	25.30 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	34.66	25.30 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	34.23	25.30 + a
Group 16: Maintenance Engineer/Oiler.	33.54	25.30 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	38.11	25.30 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	35.53	25.30 + a
-----PAINTERS (Including Drywall Finishing)-----		
10a) Brush and Roller	35.62	22.55
10b) Taping Only/Drywall Finishing	36.37	22.55
10c) Paperhanger and Red Label	36.12	22.55
10e) Blast and Spray	38.62	22.55
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	44.63	32.95
12) Well Digger, Pile Testing Machine	37.26	24.05 + a
Roofer: Cole Tar Pitch	42.0	19.55 + a
Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing	40.5	19.55 + a
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	46.92	42.80
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)	44.63	32.95

-----TRUCK DRIVERS-----

17a) 2 Axle	29.86	25.79 + a
17b) 3 Axle, 2 Axle Ready Mix	29.97	25.79 + a
17c) 3 Axle Ready Mix	30.03	25.79 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	30.08	25.79 + a
17e) 4 Axle Ready Mix	30.13	25.79 + a
17f) Heavy Duty Trailer (40 Tons and Over)	30.35	25.79 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	30.13	25.79 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	45.92	26.08 + 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*

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

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)***
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson***
- 3) Cranes (under 100 ton rated capacity)***

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

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

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

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

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

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

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. 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.

Project: Auditorium AC Upgrades at Western Middle School (Greenwich)

~~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.

Important Information:

For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

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

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

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

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
- 3) Cranes (under 100 ton rated capacity)

Crane with boom including jib, 150 feet - \$1.50 extra.

Crane with boom including jib, 200 feet - \$2.50 extra.

Crane with boom including jib, 250 feet - \$5.00 extra.

Crane with boom including jib, 300 feet - \$7.00 extra.

Crane with boom including jib, 400 feet - \$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 one apprentice in a specific trade.

Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work

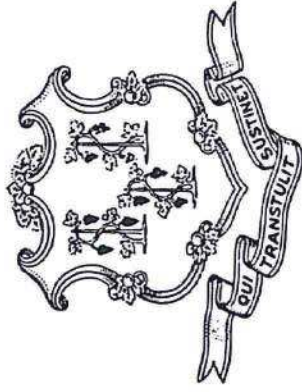
- The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
- Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the contractor's 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.ctdol.state.ct.us.
- 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.

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 Persons 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.



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.

STATUTE 31-55a

- SPECIAL NOTICE -

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

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

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

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


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

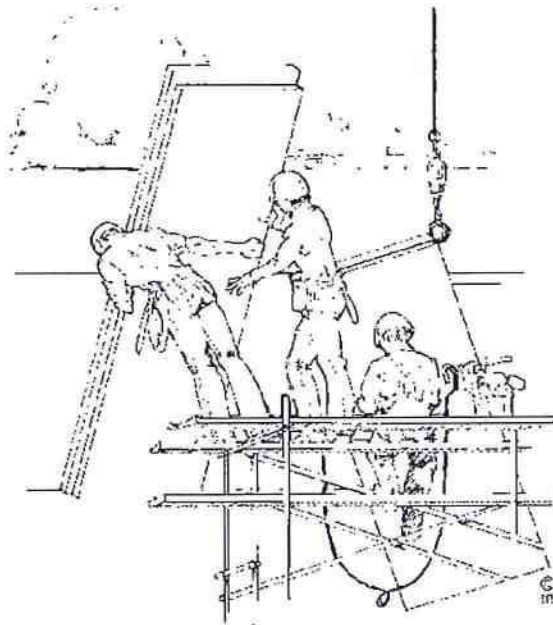
~NOTICE~

TO ALL CONTRACTING AGENCIES

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

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

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



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

CONTRACTING AGENCY CERTIFICATION FORM

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

for _____, located at _____,
contracting agency address

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

_____, located at _____,
project name and number address

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

CONTRACTOR INFORMATION

Name: _____

Address: _____

Authorized Representative: _____

Approximate Starting Date: _____

Approximate Completion Date: _____

Signature

Date

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

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor

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

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

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

Signed

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

Notary Public

Return to:

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

Rate Schedule Issued (Date): _____

[illegible]

***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

Week-Ending Date:
Contractor or Subcontractor:

WEEKLY PAYROLL

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE							Total ST Hours	BASE HOURLY RATE		TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS			GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				S	M	T	W	TH	F	S		Total OT Hour	TOTAL FRINGE Per Hour BENEFIT PLAN CASH			FRINGE 1 through 6 (see back)				

• 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 CERTIFICATION FOR PUBLIC WORKS PROJECTS															Connecticut Department of Labor Wage and Workplace Standards Division 200 Folly Brook Blvd. Weathersfield, CT 06109									
WEEKLY PAYROLL															WORKERS COMPENSATION INSURANCE CARRIER Travelers Insurance Company POLICY # #BAC8888928 EFFECTIVE DATE: 1/1/09 EXPIRATION DATE: 12/31/09									
SUBCONTRACTOR NAME & ADDRESS XYZ Corporation 2 Main Street Yanville, CT 06389															GROSS PAY FOR THIS PREVAILING RATE JOB									
CONTRACTOR NAME AND ADDRESS Landon Corporation, 15 Connecticut Avenue, Northford, CT 06472															TOTAL DEDUCTIONS									
PAYROLL NUMBER															FEDERAL STATE									
PERSON/WORKER ADDRESS AND SECTION															WITH- HOLDING									
Week-Ending Date 9/26/09															GROSS PAY FOR ALL WORK PERFORMED THIS WEEK									
APPR MALE/ RATE FEMALE AND RACE															TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)									
PROJECT NAME & ADDRESS DOT 105-296, Route 82															BASE HOURLY RATE									
CLASSIFICATION Trade License Type & Number - OSHA In Certification Number															TOTAL FRINGE BENEFIT PLAN CASH									
DAY AND DATE															GROSS PAY FOR THIS WEEK									
S M T W TH F S															FICA									
HOURS WORKED EACH DAY															LIST OTHER									
S-TIME 40 O-TIME															CHECK # AND NET PAY									
1	Robert Craft 81 Maple Street Willimantic, CT 06226	M/C	E-1 1234567 Owner OSHA 123456	8	8	8	8	8	8	8	8	8	8	8	\$ 30.75 Base Rate \$ 8.82 Cash Fringe	\$ 1,582.80	xxx.xx	xxx.xx	P-xxx	\$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	8	8	8	8	8	\$ 19.99 Base Rate \$ 16.63 Cash Fringe	\$ 1,464.80	xxx.xx	xxx.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	8	8	8	8	8	8	8	8	8	\$ 1,500.00	\$1,500.00	xxx.xx	xxx.xx	M-xxx	#125 xxx.xx				

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

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

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

Please specify the type of benefits provided:

- 1) Medical or hospital care Blue Cross 4) Disability _____
2) Pension or retirement _____ 5) Vacation, holiday _____
3) Life Insurance Utopia 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 owner 10/2/09
(Signature) (Title) Submitted on (Date)

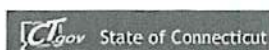
Section B: Applies to CONNDOT Projects ONLY

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

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CPI 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



Governor Dannel P. Malloy

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CONNECTICUT DEPARTMENT OF LABOR

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Misclassification \(JEC\)](#)[Stop Work Orders](#)[Reports of Activities](#)[FAQs](#)[Newsroom](#)[Contact Us](#)**OCCUPATIONAL CLASSIFICATION BULLETIN**

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.

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.

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.

- **CLEANING LABORER**

- The clean up of any construction debris and the general cleaning, including sweeping, wash down, mopping, wiping of the construction facility, washing, polishing, dusting, etc., prior to the issuance of a certificate of occupancy falls under the *Labor classification*.

- **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/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 requires either a blended rate or 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 requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.
- **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. Past practice using the applicable licensed trades, Plumber, Sheet Metal, Sprinkler Fitter, and Electrician, is not inconsistent with the Insulator classification and would be permitted.
- **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), metal bridge handrail, and decorative security fence 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 hanging+ 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. (tear-off and/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, assemble, install 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, wall panel siding, 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. Insulated metal and insulated composite panels are still installed by the Iron Worker. 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.

- **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**

- **Definitions:**

- 1) "Site of the work" (29 Code of Federal Regulations (CFR) 5.2(l)(b) is the physical place or places where the building or work called for in the contract will remain and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project;
 - (a) Except as provided in paragraph (l) (3) of this section, job headquarters, tool yards, batch plants, borrow pits, etc. are part of the "site of the work"; provided they are dedicated exclusively, or nearly so, to the performance of the contract or project, and provided they are adjacent to "the site of work" as defined in paragraph (e)(1) of this section;
 - (b) Not included in the "site of the work" are permanent home offices, branch plant establishments, fabrication plants, tool yards etc. of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular State or political subdivision contract or uncertain and indefinite periods of time involved of a few seconds or minutes duration and where the failure to count such time is due to consideration justified by industrial realities (29 CFR 785.47)
- 2) "Engaged to wait" is waiting time that belongs to and is controlled by the employer which is an integral part of the job and is therefore compensable as hours worked. (29 CFR 785.15)
- 3) "Waiting to be engaged" is waiting time that an employee can use effectively for their own purpose and is not compensable as hours worked. (29 CFR 785.16)
- 4) "De Minimus" is a rule that recognizes that unsubstantial or insignificant periods of time which cannot as a practical administrative matter be precisely recorded for payroll purposes, may be disregarded. This rule applies only where there are uncertain and indefinite periods of time involved of a short duration and where the failure to count such time is due to consideration justified by worksite realities. For example, with respect to truck drivers on prevailing wage sites, this is typically less than 15 minutes at a time.

- **Coverage of Truck Drivers on State or Political subdivision Prevailing Wage Projects**

- Truck drivers are covered for payroll purposes under the following conditions:
 - Truck Drivers for time spent working on the site of the work.
 - Truck Drivers for time spent loading and/or unloading materials and supplies on the site of the work, if such time is not de minimus
 - Truck drivers transporting materials or supplies between a facility that is deemed part of the site of the work and the actual construction site.
 - Truck drivers transporting portions of the building or work between a site established specifically for the performance of the contract or project where a significant portion of such building or work is constructed and the physical places where the building or work outlined in the contract will remain.

For example: Truck drivers delivering asphalt are covered under prevailing wage while "engaged to wait" on the site and when directly involved in the paving operation, provided the total time is not "de minimus"

- Truck Drivers are **not** covered in the following instances:

- Material delivery truck drivers while off "the site of the work"
- Truck Drivers traveling between a prevailing wage job and a commercial supply facility while they are off the "site of the work"
- Truck drivers whose time spent on the "site of the work" is de minimus, such as under 15 minutes at a time, merely to drop off materials or supplies, including asphalt.

These guidelines are similar to U.S. Labor Department policies. The application of these guidelines may be subject to review based on factual considerations on a case by case basis.

For example:

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

Any questions regarding the proper classification should be directed to:

*Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543*

200 Folly Brook Boulevard, Wethersfield, CT 06109 / Phone: 860-263-6000
Home | CT.gov Home | Send Feedback<%end if%><%if cbool (request.Cookies(Application("HOME_NAME"))("AA"))=true and request.Cookies(Application("HOME_NAME"))("CA")<>"CF83CBC7" then call Session_WriteString(" | Admin") end if%>
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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.

SECTION 000462 - REFERENCES

List at least five (5) references for similar projects in size, scope, and complexity, within Connecticut and / or New York.

THIS PAGE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID.

- 1) Client _____
Project Address _____
Approximate \$ Value _____ Date: Started _____ Completed _____
Contact: Name _____ Telephone # _____
- 2) Client _____
Project Address _____
Approximate \$ Value _____ Date: Started _____ Completed _____
Contact: Name _____ Telephone # _____
- 3) Client _____
Project Address _____
Approximate \$ Value _____ Date: Started _____ Completed _____
Contact: Name _____ Telephone # _____
- 4) Client _____
Project Address _____
Approximate \$ Value _____ Date: Started _____ Completed _____
Contact: Name _____ Telephone # _____
- 5) Client _____
Project Address _____
Approximate \$ Value _____ Date: Started _____ Completed _____
Contact: Name _____ Telephone # _____

END OF SECTION 000462

SECTION 000472 – FORM OF BID BOND

TOWN OF GREENWICH, CONNECTICUT
BID BOND

Date Bond Executed

Principal

Surety

Penal Sum of Bond (express in words and figures)

Date of Bid

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the Town of Greenwich, Connecticut, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents, THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated as shown above for _____.

(name of bid)

NOW THEREFORE, if the principal shall not withdraw said bid within the period specified therein after the opening of the same, or if no period be specified, within sixty (60) days after said opening, and shall within the period specified therefor, or if no period specified, within ten (10) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the term of the Bid as accepted, and give bonds with good and sufficient surety or sureties as may be required, for the faithful performance and proper fulfillment of the resulting contract, and for the protection of all person supplying labor and material in the prosecution of the work provided for in such contract or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the Town of Greenwich, Connecticut, the difference between the amount specified in said bid and the amount for which said Town may procure the required work, supplies, and services, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF the above bounden parties have executed this instrument under their several seals on the date indicated above. The name and corporate seal (if applicable) of each corporate party being hereto affixed:

Name of Partnership

_____(SEAL)

Business Address

Partner- (Hereunto Duly Authorized)

IN THE PRESENCE OF:

WITNESS

INDIVIDUAL PRINCIPAL

1. _____ AS TO _____ (SEAL)

2. _____ AS TO _____ (SEAL)

3. _____ AS TO _____ (SEAL)

4. _____ AS TO _____ (SEAL)

CORPORATE/ LLC PRINCIPAL

WITNESS

BUSINESS ADDRESS AFFIX
CORPORATE
SEAL

BY- (HEREUNTO DULY AUTHORIZED)

TITLE

CORPORATE/ LLC PRINCIPAL

WITNESS

BUSINESS ADDRESS AFFIX
CORPORATE
SEAL

BY- (HEREUNTO DULY AUTHORIZED)

TITLE

SECTION 000473 - CERTIFICATE AS TO CORPORATE PRINCIPAL

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the
_____ of the corporation named as principal in the within bond;
that _____, who signed said bond on behalf of the principal, was
then _____ of the corporation; that I know his signature, and his signature
thereto is genuine; and that said bond was duly signed, sealed and attested for and in behalf of said
corporation by authority of its governing body.

(Corporate Seal)

END OF SECTION 000473

SECTION 000474 – PERFORMANCE, MAINTENANCE AND PAYMENT BOND

BOND NO. _____ **CONTRACT NO.** _____

KNOW ALL MEN BY THESE PRESENTS. That we _____

_____, as Principal, and _____

a corporation organized under the laws of the State of _____ and authorized to do business in the State of Connecticut as Surety, for holden and firmly bound jointly and severally unto the Town of Greenwich, Connecticut, herein referred to as the Town, the territorial corporation located in the County of Fairfield, in the penal sum of

_____ Dollars (\$ _____),

to be paid to it or its certain attorney, successors or assigns, to which payment well and truly to be made, we the said Obligors do bind ourselves, and each of us, our heirs, executors, administrators, and successors firmly by these presents.

IN WITNESS WHEREOF we have hereunto set for cause to be set our respective hands, names and seals this

_____ day of _____, 20____

The condition of this obligation is such, that whereas the above named Principal has entered into a certain written contract with the Town of Greenwich, Connecticut, dated the

_____ day of _____, 20____

NOW, THEREFORE, if the said Principal shall well and faithfully perform said contract according to its provisions, and fully indemnify and save harmless the Town from all costs and damages which the Town may suffer by reason of failure so to do, and shall pay for all equipment, appurtenances, materials and labor furnished, used or employed in the execution of said contract, and shall indemnify and save harmless the Town from all suits or claims of any nature or description against the Town by reason of any injuries or damages sustained by any person or persons on account of any act or omission of said Principal, his servants or agents, or his subcontractors in the construction of the work or in guarding the work, or on account of the use of faulty or improper materials, or by reason of claims under the Workmen's Compensation Laws or other laws by any employee of the Principal or his subcontractors, or by reason of the use of patented material, machinery, device, equipment, process, method of construction or design in any way involved in the work, and shall indemnify the Town against such defective workmanship, material and equipment as may be discovered within one (1) year after completion and final acceptance of the work, and shall make good in such defective workmanship and material as may be discovered within said period of one (1) year, then the obligation shall be void, otherwise to remain in full force and effect.

The Surety hereby stipulates and agrees that any modifications, omissions or additions in or to the terms of the aforesaid contract, or in or to the plans or specifications therefor, or any extension of time, shall in no wise affect the obligation of the Surety under this bond, the surety hereby waiving any and all right to any notice of any such modifications, omissions, changes, additions or extensions.

Contractor Name: _____ By: _____

Surety Name: _____ By: _____

END OF SECTION 000474

SECTION 000481 - INSURANCE PROCEDUREPLEASE NOTE:

THIS PAGE MUST BE RETURNED WITH YOUR BID/PROPOSAL. FAILURE TO DO SO MAY RESULT IN YOUR BID/PROPOSAL BEING REJECTED.

Please take the insurance requirements of the Contract to your agent/broker immediately upon receipt of the bid documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in this Request for Bid/Proposal. Any bids/proposals with deficient insurance requirements will be rejected. The firm who is awarded the Bid/Proposal must return the contract, agent/broker and insurance form within two (2) weeks from the date on the award letter.

PLEASE CHECK THE APPROPRIATE BOX**YES****NO**

1. General Liability \$3,000,000.00
Includes minimum coverages for combined bodily injury and property damage liability of \$2,000,000 general aggregate and \$1,000,000 per occurrence.
2. Automobile Liability \$1,000,000.00
3. Excess Liability \$5,000,000.00
4. Worker's Compensation and Employer's Liability
5. Ability to Return Contract and Insurance Documents Within Two (2) Weeks
6. Able to Provide the Town with Thirty (30) Days Prior Written Notice of Cancellation

STATEMENT OF VENDOR:

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. The bid/proposal cost reflects any additional costs relating to insurance requirements for this work.

Signature

Date

Contract**END OF SECTION 000481**

SECTION 000482 – INSURANCE REQUIREMENTS

Insurance Requirements: Before starting and until final completion and acceptance of the work called for in the Contract and expiration of the guarantee period provided for in the Contract, the Contractor and its subcontractors, if any, shall procure and maintain insurance of the types and amounts checked in paragraphs A through F below for all Contract operations.

- ☒ A. General Liability, with minimum coverages for combined bodily injury and property damage liability of \$2,000,000 general aggregate, \$1,000,000 per occurrence including:
- ☒ 1. Commercial General Liability.
 - ☒ 2. Town as additional insured.
 - ☐ 3. Owners and Contractors Protective Liability (separate policy in the name of the Town).
- ☒ B. Comprehensive Automobile Liability, with minimum coverages of \$1,000,000 combined single limit for bodily injury and property damage, including, where applicable, coverage for any vehicle, all owned vehicles, scheduled vehicles, hired vehicles, non-owned vehicles and garage liability.
- ☒ C. Excess Liability, with minimum coverage of \$5,000,000 in umbrella form, or such other form as approved by Town Department Head and Risk Management Director.
- ☒ D. Workers' Compensation and Employer's Liability, with minimum coverages as provided by Connecticut State Statutes.
- ☐ E. Professional Liability (for design and other professionals for Errors and Omissions), with minimum coverage of \$1,000,000. If the policy is on a claims-made basis, coverage shall be continually renewed or extended for three (3) years after work is completed under the Contract.
- ☐ F. Other (Builder's Risk, etc.):_____.
- ☒ G. **CERTIFICATE HOLDER: TOWN OF GREENWICH**
ATTN: BOARD OF EDUCATION. (Also fill in on ACORD Certificate of Insurance)
101 Field Point Road, Greenwich, CT 06830.

The **Acord certificate of insurance form** must be executed by your insurance agent/broker and returned to this office. The most current Acord form should be used for insurance documentation purposes. Company name and address must conform on all documents including insurance documentation. It is required that the agent/broker note the individual insurance companies providing coverage, rather than the insurance group, on the Acord form. The Contract number (provided to the awarded Contractor), project name and a brief description must be inserted in the "Description of Operations" field. It must be confirmed on the Acord Form that the Town of Greenwich is endorsed as an additional insured by having the appropriate box checked off and stating such in the "Description of Operations" field. A letter from the awarded vendor's agent/broker certifying that the Town of Greenwich has been endorsed onto the general liability policy as an additional insured is also mandatory. This letter must follow exactly the format provided by the Purchasing Department and must be signed by the same individual authorized representative who signed the Acord form, both of which must be signed with original ink "wet" signatures. If the

insurance coverage required is provided on more than one Acord certificate of insurance, then additional agent/broker letters are also required. Contract development will begin upon receipt of complete, correct insurance documentation.

The Contractor shall be responsible for maintaining the above insurance coverages in force to secure all of the Contractor's obligations under the Contract with an insurance company or companies with an AM Best Rating of A:VII or better, licensed to write such insurance in Connecticut and acceptable to the Risk Manager, Town of Greenwich. For excess liability only, non-admitted insurers are acceptable, provided they are permitted to do business through Connecticut excess line brokers per listing on the current list of Licensed Insurance Companies, Approved Reinsurers, Surplus Lines Insurers and Risk Retention Groups issued by the State of Connecticut Insurance Department.

END OF SECTION 000482

SECTION 000483A – SAMPLE ENDORSEMENT LETTER

**AGENT/BROKER
(LETTERHEAD)**

(Date)

Eugene H. Watts, Senior Buyer
Purchasing Department
Town of Greenwich/Board of Education
290 Greenwich Avenue – Havemeyer Building
Greenwich, CT 06830

**Re: Company
 Town of Greenwich/Board of Education / Contract # XXXX
 Project Name**

Dear Mr. Watts:

The undersigned hereby certifies as follows:

- (1) I am a duly licensed insurance agent under the laws of the State of **[insert State]** and an authorized representative of all companies affording coverage under the Acord form submitted herewith;
- (2) The Town of Greenwich has been endorsed as an additional insured under the general liability policy no. [insert policy number], issued by **[insert company affording coverage]** to **[name of insured]**;
- (3) The general liability policy referenced in paragraph (2) above meets or exceeds the coverage in Commercial General Liability ISO form CG 00 01 10 01, including contractual liability;
- (4) The policies listed in the Acord form submitted to the Town of Greenwich in connection with the above-referenced contract have been issued to the insured in the amounts stated and for the periods indicated in the Acord form; and
- (5) The Town of Greenwich shall be given thirty (30) days prior written notice of cancellation, lapse or restrictive amendment (except ten days notice of nonpayment) of the policies listed in the Acord form.

Sincerely,

Authorized Representative for all companies listed in the Acord form

END OF SECTION 000483A

000483B – A.M. BEST KEY RATING GUIDE FORM

The following insurance companies are licensed in the State of Connecticut per the 2011 edition of the
A.M. Best Key Rating Guide for Property and Casualty,

1. Company Name: _____
a) Page Number: _____
b) Rating is: _____

2. Company Name: _____
a) Page Number: _____
b) Rating is: _____

3. Company Name: _____
a) Page Number: _____
b) Rating is: _____

4. Company Name: _____
a) Page Number: _____
b) Rating is: _____

5. Company Name: _____
a) Page Number: _____
b) Rating is: _____

6. Company Name: _____
a) Page Number: _____
b) Rating is: _____

END OF SECTION 000483B

SECTION 000483C - AFFIRMATIVE ACTION COMPLIANCE AFFIDAVIT**COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS NOTIFICATION TO
BIDDERS****AFFIRMATIVE ACTION COMPLIANCE AFFIDAVIT**

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes. According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to “aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials.” “Minority business enterprise” is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: “(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n.” “Minority” groups are defined in Section 32-9n of the Connecticut General Statutes as “(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . .” An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

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

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

***INSTRUCTIONS:** Bidders must sign acknowledgement below and return acknowledgement to Awarding Agency along with bid proposal.

The undersigned acknowledges receiving and reading a copy of the “Notification to Bidders” form.

Signature

Date

On behalf of:

END OF SECTION 000483C

SECTION 000484B – SAMPLE CONTRACT

**THE FOLLOWING PAGES ARE A SAMPLE COPY OF THE TOWN OF
GREENWICH CONTRACT FOR YOUR REVIEW. YOU MUST BE ABLE
TO SIGN THIS CONTRACT AND MEET THE NECESSARY INSURANCE
AS REQUIRED BY THE TOWN OF GREENWICH IN ORDER FOR YOUR
PROPOSAL TO BE CONSIDERED.**

**GREENWICH PUBLIC SCHOOLS
WESTERN MIDDLE SCHOOL
AUDITORIUM AC UPGRADE**

**State of
Connecticut**

**Town of
Greenwich
Contract**

Town Department:
Division:

Contract No.:
Account Name:

Name and
Address
Of

Account Code
Total Amount
of Contract

This Agreement made this day of _____ between Town of Greenwich/BOE hereafter called the Town and (Company Name) hereafter called the Contractor Witnessed as follows:

1. The contractor agrees to furnish materials and perform services as shown in specifications and contract documents hereto attached and made a part hereof, and consisting of numbered pages from 1 to _____.
2. The Town agrees to pay the price designated for such materials and services upon certification by the proper agent of the Town.
3. This contract shall not be valid until approved by the Town Counsel and countersigned by the Town Comptroller.

TOWN OF GREENWICH

CONTRACTOR

By _____
It's Managing Director of Operations
Benjamin B. Branyan

By _____
It's _____

CORPORATE ACKNOWLEDGEMENT

STATE OF
CONNECTICUT

ss: _____, 2020

COUNTY OF FAIRFIELD

Personally appeared _____ of
_____ Name and title of Officer

Signer and sealer of the foregoing instrument, who being duly authorized and appointed by the Board of Directors of said Corporation, acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said

_____, before me

(Corporation)

Notary Public

**INDIVIDUAL OR PARTNERSHIP
ACKNOWLEDGEMENT**

STATE OF _____ (delete words in parenthesis if not a partnership)

CONNECTICUT)) ss: _____, 2020

COUNTY OF _____

FAIRFIELD)

Personally appeared _____, (one of the members of the partnership of _____,
Name and title of Officer

signer and sealer of the foregoing instrument and acknowledged the same to be his free act and deed
(and the free act and deed of said partnership), before me

Notary

Public

Approved as to legal sufficiency

Date _____

Town Counsel

I _____ hereby certify that the estimated amount of this
contract does not exceed the unencumbered balances of amounts duly appropriated and against
which this contract is chargeable as indicated hereon.

Date _____

Comptroller

AGREEMENT

CONTRACT NO.

THIS AGREEMENT, executed this _____ day of _____ in the year Two Thousand Nineteen (herein referred to as the "AGREEMENT"), by and between the Town of Greenwich, Connecticut, _____ acting _____ through _____ hereunto duly authorized, "OWNER" and _____, acting through _____ (insert name of individual and title) duly authorized, "CONTRACTOR".

WITNESSETH, that the parties to these presents, each in consideration of the under-taking, promises and agreements on the part of the other herein contained, have undertaken, promised and agreed to do hereby undertake, promise and agree, the Owner for itself, its successors and assigns, and the Contractor for himself and his heirs, executors, administrators, successors and assigns, as follows:

1. DEFINITIONS:

Wherever the words hereinafter defined or pronouns used in their stead occur in the Contract Documents, they shall have the following meaning:

The word "Owner" shall mean the Town of Greenwich and shall include its authorized representative.

The word "Contractor" shall mean the person or organization identified as such in this Agreement and shall include his authorized representative.

The words "Contracting Officer or Agency" shall mean that official of the Town which awards the contract, executes the Agreement and is the Owner's authorized representative.

The Information for Bidders, the Contractor's Bid as accepted by the Owner, the Contract Conditions and Specifications and the General, Technical and Materials Specifications, the Drawings, and all addenda and amendments to any of the foregoing, collectively constitute the Contract Documents, and are sometimes herein referred to as the "Contract".

2. DESCRIPTION OF WORK:

This project consists of the Auditorium AC Design.

3. **PAYMENT:**

The Contractor shall be paid on a monthly basis after presentation of vouchers, and subject to acceptance and approval by the Town of Greenwich.

Such payments will be made by the Town of Greenwich monthly for all services actually rendered, and the acceptance by the Contractor of any such monthly payment shall be a release to the Town of all claims and all liability to the Contractor in connection with the contract, arising during the period for which payment is made. No payment, however, shall operate to release the Contractor or its sureties or insurers from any obligation under the Contract to be entered into or the Performance Bond or any insurance policies issued in connection with said contract.

4. **PERFORMANCE MAINTENANCE AND PAYMENT BOND:**

The Contractor shall, simultaneously with the signing of the Contract, furnish the Town the executed Performance, Maintenance and Payment Bond of a surety company authorized to do business in the State of Connecticut, and acceptable to the Town, in the sum of the full amount of the Contract obligation in the form provided by the Town.

THE ABOVE IS ONLY REQUIRED FOR CONTRACTS EXCEEDING \$100,000.00.

5. **GUARANTEE:**

The Contractor guarantees that the Work and services to be performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, if any, Specifications, and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the Work as stated in the final estimate. The Contractor shall repair, correct or replace as required, promptly and without charge, all work, equipment and material, or parts thereof, which fail to meet the above guarantee or which in any way fail to comply with or fail to be in strict accordance with the terms and provisions and requirements of the Contract during such one-year period, and also shall repair, correct, or replace all damage to the Work resulting from such failure.

6. **DEFECTIVE WORK:**

The inspection of the Work shall not relieve the Contractor of any of his obligations to perform and complete the Work as required by the Contract. Defective work shall be corrected and unsuitable materials, equipment apparatus and other items shall be replaced by the Contractor, notwithstanding that such work, materials, equipment, apparatus and other items may have been previously overlooked or accepted or estimated for payment. If the work or any part thereof shall be found defective at any time before the final acceptance of the work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Town; if any material, equipment, apparatus or other items brought upon the site for use or incorporation in the work, or selected for the same, is condemned by the Town as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall

forthwith remove such materials, equipment, apparatus and other items from the site of the Work and shall at his own cost and expense make good and replace the same and any material furnished by the Town which shall be damaged or rendered defective by the handling or improper installation by the Contractor, his agents, servants, employees or subcontractors.

7. COMPLIANCE WITH LAWS:

The Contractor shall keep himself fully informed of all existing and future federal, state and local laws, ordinances, rules and regulations affecting those engaged or employed on the work, the materials and equipment used in the work or the conduct of the work, and of all orders, decrees and other requirements of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, if any, Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall forthwith report the same to the Town in writing. The Contractor shall at all times observe and comply with, and cause all his agents, servants, employees and subcontractors to observe and comply with all such existing and future laws, ordinances, rules, regulations, orders, decrees and other requirements, and he shall protect, indemnify and save harmless the Town, its officers, agents, servants and employees from and against any and all claims, demands, suits proceedings, liabilities, judgments, penalties, losses, damages costs and expenses, including attorneys' fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulation, order, decree or other requirement, whether committed by the Contractor or any of his agents, servants, employees or subcontractors.

8. INDEMNITY:

The Contractor shall indemnify and save harmless the Town and its officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damage to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the Work, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence or fault of the Contractor, his officers, agents, servants or employees, any of his subcontractors, the Town any of his respective officers, agents, servants or employees and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings; and provided that the Contractor shall not be required to indemnify the Town, its officers, agents, servants or employees against any such damages occasioned solely by acts or omissions of the Town other than supervisory acts or omissions of the Town in connection with the Work.

INDEMNITY AGAINST SUBCONTRACTORS' CLAIMS:

If any other contractor or any subcontractor of any such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the Contractor or of any of his subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss or damage. The Contractor agrees to and does hereby indemnify and save harmless the Town from and against any and all claims by such other contractors or subcontractors, alleging such loss, damage or delay and from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses including attorneys' fees, arising out of, relating to or resulting from such claims.

9. PATENTS:

The Contractor shall indemnify and save harmless the Town and all persons acting for or on behalf of the Town from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorneys' fees, arising from or occasioned by an infringement or alleged infringement of any patents or patent rights on any invention, process, materials, equipment, article, or apparatus, or any part hereof, furnished and installed by the Contractor, or arising from or occasioned by the use or manufacture thereof, including their use by the Town.

10. CHANGES:

The Town, through its designated Agent, may make changes in the Work and in the Drawings, if any, and Specifications therefore by making alterations therein, additions, thereto or omissions therefrom. All work resulting from such changes shall be performed and furnished under and pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the Work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefore. For eliminated or decreased work the Contractor shall allow the Town a reasonable credit as determined by the Parties. Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Town authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

The Contractor agrees that he shall neither have nor assert any claim for or be entitled to any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

11. CLAIMS FOR DAMAGES:

If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained whichever date is the earlier, file with the Contracting Officer a written, itemized statement of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such

statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Contracting Officer shall file with the appropriate department of the Town, one copy of the statement, and shall file with the Town and the Contractor his determination thereon. The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction, instruction, determination or decision of the Town or its agents, nor shall any such claims be considered, unless the Contractor shall have complied in all respects with the provisions of this paragraph.

12. ABANDONMENT OF THE WORK OR OTHER DEFAULT:

If the Work shall be abandoned, or any part thereof shall be sublet without previous written consent of the Town, or the Contract or any moneys payable hereunder shall be assigned otherwise than as herein specified, or if at any time the Contracting Officer shall be of the opinion, and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the Work or any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the Contract, or if the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the Contract, the Town may notify the Contractor in writing, with a copy of such notice mailed to the surety, to discontinue all Work or any part thereof; thereupon the Contractor shall discontinue such Work or such part thereof as the Town may designate; and the Town may, upon giving such notice, by Contract or otherwise as it may determine, complete the Work or such part thereof and charge the entire cost and expense of so completing the work. The Town shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay to the Town any losses, damages, costs and expenses, including attorneys' fees, sustained or incurred by the Town by reason of any of the foregoing causes. For the purpose of such completion the Town may for itself or for any Contractors employed by the Town take possession of and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the Work.

All costs, expenses, losses, damages, attorneys' fees, and any and all other charges incurred by the Town under this subsection shall be charged against the Contractor and deducted and/or paid by the Town out of any moneys due and payable or to become due or payable under the Contract to the Contractor; in computing the amounts chargeable to the Contractor, the Town shall not be held to a basis of the lowest prices for which the completion of the Work or any part thereof might have been accomplished, but all sums actually paid or obligated therefore to effect its prompt completion shall be charged to and against the account of the Contractor. In case the costs, expenses, losses, damages, attorneys' fees and other charges together with all payments theretofore made to or for the account of the Contractor are less than the sum which would have been payable under the Contract if the Work had been properly performed and completed by the

Contractor, the Contractor shall be entitled to receive the difference, and, and in case such costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments theretofore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the Town.

13. LIENS:

If at any time any notices of lien or other legal process are filed for labor performed or materials or equipment manufactured, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same, and until such discharge, removal or disposition, the Town shall have the right to retain from any moneys payable hereunder an amount which, in its sole judgment, it deems necessary to satisfy such liens and pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce the same, or incurred in connection therewith or by reason thereof.

14. CLAIMS:

If at any time there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Town may retain from any moneys which would otherwise be payable hereunder so much thereof as, in its sole judgment, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce such claims or incurred in connection therewith or by reason thereof.

15. LIABILITY OF TOWN:

No person, firm or corporation, other than the Contractor, who signed this Contract as such, shall have any interest herein or rights hereunder. No claim shall be made or be valid either against the Town or any agent of the Town and neither the Town nor any agent of the Town shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the Town and of every agent of the Town of and from any and all claims, demands, damages and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the Work or for or on account of any act or neglect of the Town or of any agent of the Town or of any other person, arising out of, relating to or by reason of the Work, except the claim against the Town for the unpaid balance, if any there be, of the amounts retained as herein provided.

16. PROVISIONS REQUIRED BY LAW DEEMED INSERTED:

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

17. PERMITS:

The Contractor shall, at his own expense, take out and maintain all necessary permits from the State, Town, or other public authorities; shall give all notices required by law; and shall post all bonds and pay all fees and charges incident to the due and lawful prosecution of the Work.

18. NOT TO SUBLET OR ASSIGN:

The Contractor shall constantly give his personal attention to the faithful prosecution of the Work, shall keep the same under his personal control, shall not assign the Contract or sublet the Work or any part thereof without the previous written consent of the Town, and shall not assign any of the moneys payable under the Contract, or his claim thereto, unless by and with the like written consent of the Town and the surety on the Contract Bonds. Any assignment or subletting in violation hereof shall be void and unenforceable.

19. EMPLOY COMPETENT PEOPLE:

The Contractor shall employ only competent people on the Work and shall not employ people or means which may cause strikes, work stoppages and/or disturbances by workmen employed by the Contractor, any subcontractor, the Town, the Contracting Officer or any other contractor. Whenever the Contracting Officer notifies the Contractor in writing that in his opinion any person on the Work is incompetent, unfaithful, disorderly, or otherwise unsatisfactory or not employed in accordance with the provisions of the Contract, such person shall be discharged from the Work and shall not again be employed on it, except with the written consent of the Contracting Officer.

20. EMPLOY SUFFICIENT LABOR AND EQUIPMENT:

If in the sole judgment of the Contracting Officer the Contractor is not employing sufficient labor, plant, equipment or other means to complete the Work within the time specified, the Contracting Officer may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Contracting Officer deems necessary to enable the Work to progress properly.

21. INTOXICATING LIQUORS:

The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the Work.

22. ACCESS TO WORK:

The Town, the Contracting Officer, and their officers, agents, servants and employees may at any and all times and for any and all purposes, enter upon the Work and the site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefore.

23. EXAMINATION OF WORK:

The Contracting Officer shall be furnished by the Contractor with every reason able facility for examining and inspecting the Work and for ascertaining that the Work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down portions of finished work by the Contractor.

24. EXTRA WORK:

The Contractor shall perform any extra work (work in connection with the Contract but not provided for herein) when and as ordered in writing by the Contracting Officer, at the unit prices stipulated in the Contract for such work or, if none are so stipulated, either (a) at the price agreed upon before such work is commenced and named in the written order for such work, or (b) if the Contracting Officer so elects, for the reasonable cost of such work, as determined by the Contractor and approved by the Contracting Officer, plus a percentage of such cost, as may be agreed upon by Contract and Contracting Officer.

25. CHANGES NOT TO AFFECT BONDS:

It is distinctly agreed and understood that any changes made in the work or the Drawings or Specifications therefore (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner or time of payments made by the Town

SAMPLE CONTRACT 000484 - 10

to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the surety on the Contract Bonds given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the surety on said bonds continue and remain in full force and effect.

26. PRICES FOR WORK:

The Town shall pay and the Contractor shall receive the prices stipulated in the Bid made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

27. MONEYS MAY BE RETAINED:

The Town may at any time retain from any moneys which would otherwise be payable hereunder so much thereof as the Town may deem necessary to complete the Work hereunder and to reimburse it for all costs, expenses, losses, damage and damages chargeable to the Contractor hereunder.

28. USE OR PARTIAL PAYMENT NOT ACCEPTANCE:

It is agreed that this is an entire contract for one whole and complete Work or result and that neither the Town's entrance upon or use of the Work or any part thereof nor any partial payments by the Town shall constitute an acceptance of the Work or any part thereof before its entire completion and final acceptance.

29. NON-CONNECTICUT CONTRACTORS:

Pursuant to Connecticut General Statutes §12-430(7), as amended by Connecticut Public Act #11-61, Section 66, a nonresident contractor shall comply with the State of Connecticut's bonding requirements.

30. PAYMENT TO SUBCONTRACTORS:

As required by Section 49-41a of the Connecticut General Statutes, within thirty days after payment to the Contractor by the Town for work under this Contract, he shall pay any amounts due any subcontractor, whether for labor performed or materials furnished when such labor or materials has been included in a requisition submitted by such Contractor and paid by the Town.

31. INSURANCE:

Insurance coverage required as noted in "Exhibit A" attached.

32. PREVAILING WAGE RATES; CONSTRUCTION SAFETY AND HEALTH COURSE:

Except as noted below, the Contractor shall comply with the current provisions of Section 31-53 of the General Statutes of the State of Connecticut, a part of which is quoted as follows:

"The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or

SAMPLE CONTRACT 000484 - 11

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 or welfare fund, as defined in subsection (h) of section 31-53 of the 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."

All Contractors and subcontractors shall submit certified weekly payrolls, on forms furnished by the Town, for all contracts meeting the aforementioned monetary limits. The certified payrolls shall be submitted with the Contractor's monthly certificate for payment.

Section 31-55a of the General Statutes of the State of Connecticut provides that the prevailing wage rates applicable to any awarded contract or subcontract are subject to annual adjustments each July 1st for the duration of the project.

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

It is the Contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's web site. The annual adjustments will be posted on the Department's of Labor web page: www.ctdol.state.ct.us. For those without Internet access, contact the division listed below.

The Contractor shall also furnish proof with the weekly certified payroll for the first week each employee begins work that any person performing the work of a mechanic, laborer or worker has completed a course of at least ten (10) hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration in accordance with Connecticut General Statutes Section 31-53b and regulations adopted by the State of Connecticut Labor Commissioner.

The provisions of this section (32) shall not apply 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 less than four hundred thousand dollars (\$400,000) or 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 less than one hundred thousand dollars (\$100,000).

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

33. GOVERNING LAW:

The laws of the State of Connecticut shall govern this Contract and any and all litigation related to this Contract. In the event of litigation related to this Contract, the exclusive forum shall be the State of Connecticut and the exclusive venue for such litigation shall be the Judicial District for Stamford/Norwalk at Stamford.

IN WITNESS, WHEREOF, the parties of the AGREEMENT have hereunto set their hand and seals the day first above written.

TOWN OF GREENWICH, CONNECTICUT

BY _____

THE CONTRACTOR

BY _____

END OF SECTION 000484

DOCUMENT 000485 – CONSENT OF SURETY

CONSENT OF SURETY

The Undersigned surety, being the surety which issued bonds No. _____ for the Town of Greenwich Contract No. ____ hereby consents to release of final payment and all retainages to the contractor- principal.

(Name of Surety)

By _____ Its

ACKNOWLEDGMENT

STATE OF

ss:

COUNTY OF

This is to certify the above signatory who executed this instrument was either known to me or satisfactorily proven to me to be the person whom he purports to be.

Notary Public

END OF SECTION 000485

SECTION 000486 AFFIDAVIT FOR FINAL PAYMENT

AFFIDAVIT FOR FINAL PAYMENT

The undersigned, being duly sworn, deposes and says:

1. That he is the _____ (Title) of the contractor in hereinafter referred to and is authorized to execute this affidavit on behalf of the contractor;
2. In connection with Contract # _____ for _____ (Project Title) it is represented that all payroll, bills for services, materials, supplies, equipment and other indebtedness have been paid or otherwise satisfied and that there are no outstanding claims against the undersigned by any sub-contractor or material supplier, or no outstanding claims to file a claim against the Town of Greenwich;
3. This affidavit is made at the request of the Town of Greenwich for the purpose of inducing final payment and knowing that it will rely upon the truth of the representation herein made.

Subscribed and sworn

to before me this _____ day of, 20____

Notary Public

(Type or print name person authorized to sign)

END OF SECTION 000486

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Project: **Auditorium AC Upgrade**
- B. Project Locations:
 - 1. **Western Middle School**
1 Western Junior Highway, Greenwich, CT
- C. Owner: Greenwich Public Schools, 290 Greenwich Ave, Greenwich, CT 06830
- D. Architect: Antinozzi Associates Architects, PC, 271 Fairfield Avenue, Bridgeport, CT 06604
- E. This project consists of renovations at the above listed school, including but not limited to **Providing new air conditioning system for the Auditorium.**
- F. Work by Owner: No separate contracts are anticipated for the completion of this work.
- G. The Project will be constructed under a single prime-contracting arrangement.

1.2 GENERAL REQUIREMENTS

- A. DIVISION 0 - BIDDING DOCUMENTS, CONTRACTS AND CONDITIONS
- B. DIVISION 1 - GENERAL REQUIREMENTS

1.3 CONTRACTOR'S USE OF PREMISES

- A. General: During the construction period the prime Contractors jointly shall have full use of the premises for construction operations, including use of the site. The General Contractors use of the premises is limited only by the Owner's right to perform work or retain other contractors on portions of the Project.
- B. Access to the building will be Monday through Friday, 6:00 am thru 9:00 pm. Access to the buildings on weekends will not be permitted without written permission by the Owner. If access is granted on weekends, the District reserves the right to invoice the Contractor for their personnel costs in the form of a change order to the Contract.
- C. Use of the Site: Limit use of the premises to work in areas indicates. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
 - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.

2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
- D. Use of the Existing Building: Maintain the existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1.4 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.
- B. Partial Owner Occupancy: The Owner reserves the right to occupy the place and install equipment in completed areas of the building prior to Final Completion, provided such occupancy does not interfere with completion of the Work, Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
 1. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.
 2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
 3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
 4. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

1.5 DEFINITIONS

- A. Definitions as applied to "Contractors" involved with the work of this Project:
 1. "The Contractor" or "Contractor" meaning that General Contractor (GC) responsible for the work referenced.
 2. "Trade Contractor" meaning that General Contractor as above; and such other terms relating to Contractors to be taken in context with respect to referenced work.
 3. Further, wherein said Division 00 and 01 and respective Sections therein, any reference is made to "General Contractor", same shall be construed to mean "Contractor for the General Construction".
 4. The Architect cannot guarantee the correctness of the existing conditions shown and assumes no responsibility therefore, it shall be the responsibility of the Contractor to visit the site and verify all existing conditions prior to bid.

- B. The Owner will purchase certain items required for the overall operation of this facility.
 - 1. The Contractor will cooperate with said vendors as may be necessary to permit the work to be accomplished.
 - a. The cooperation may extend to the receiving, unloading and placement of said equipment if directed by the Owner.
 - b. Terms of payment, if any, shall be in accordance with Article 7 of the General Conditions as amended or modified.
- C. The Contractor is advised that the Owner may enter into separate contracts as may be in their best interests.
- D. **ADDITIONAL SECURITY PROVISIONS**
 - 1. All Contractors' employees shall use a single means of access and egress, except in the case of emergency, to be designated by the Owner.
 - 2. Each Contractor and each Subcontractor shall require his employees, while on the job site, to wear, in a conspicuous location, a Photo I.D. button bearing the name of the Contractor. The buttons of each Contractor shall be numbered consecutively. An up-to-date list of all I.D. buttons, indicating the name and number for each employee, shall be furnished to the Construction Manager.

1.6 ASBESTOS AND LEAD PAINT AWARENESS REQUIREMENTS

- A. Contractor agrees not to use or permit the use of any asbestos containing material in or on any property belonging to the Owner.
- B. For purposes of this requirement, asbestos free shall mean free from all forms of asbestos, including - actinolite, amosite, anthrophyllite, chrysotile, cricidolite and tremolite, both in friable and non-friable states and without regard to the purposes for which such material is used.

1.7 CONSTRUCTION TIME REQUIREMENTS

- A. The Contractor is advised the "time is of the essence" of the Contract as defined in Article 8 of the "General Conditions" for the completion of the construction of the facility.
 - 1. It is understood that the work is to be carried through to completion with the utmost speed consistent with good workmanship.
 - 2. Time of Completion shall be as established in the Milestone Schedules (Section 011100).
 - 3. In the event that the work is not substantially complete as outlined in the Milestone Schedule, liquidated damages will be in effect at \$500 per calendar day and if all

work is not final complete per the Milestone Schedule, the liquidated damages will increase to \$2,500 per calendar day.

4. Further, safe and legal ingress and egress shall be maintained at all times to and through the occupied portions of the construction site.
 - B. Work shall proceed in such a manner as to cause the least amount of disruption to the ongoing operations as possible.
 - C. COORDINATE CLOSELY WITH SCHOOL OPERATING PERSONNEL.
 - D. All work and storage areas shall be completely enclosed by a fence or barricade at all times so that no student or the public can approach the area or the equipment.
 1. The Contractor shall maintain fences and barricades at all times and shall -
 2. Repair/ restore and/ or pay for any temporary fencing damaged by their work.
 3. Maintain at all times, all exits and walkways from the Building.
 4. Where the barricade is removed for work, the Contractor performing such work shall provide adequate safety personnel to prevent unauthorized persons from approaching the work area.
- 1.8 PROOF OF ORDERS AND DELIVERY DATES - Coordinate with Sections 01 3300.
- A. Within 2 weeks after the approval of shop drawings, samples, product data and the like, the Contractor shall provide copies of purchase orders for all equipment and materials which are not available in local stock. The Contractor shall submit written statements from suppliers confirming the orders and stating promised delivery dates.
- 1.9 INTENT OF DOCUMENTS
- A. In the event of conflict, ambiguity and/or unclear circumstances between any of the requirements of the Contract Documents, the requirement that is most inclusive and of highest quality, quantity, and/or cost shall govern. The Contractor shall (1) provide the better quality or greater quantity of Work and/or (2) comply with the more stringent requirement; either or both in accordance with the Architect's interpretation. The Contractor herewith agrees that no extra compensation shall be awarded to him based upon a claim of conflict, ambiguity or unclear circumstances in the Contract Documents. See the General Conditions for greater detail.
- 1.10 FIELD MEASUREMENTS
- A. The General Contractor shall take all necessary field measurements prior to fabrication and installation of work and shall assume complete responsibility for accuracy of same.
 - B. This project is an ALTERATION / RENOVATION and therefore necessitates additional

attention to existing conditions receiving newly fabricated and installed equipment, i.e. note the requirements for field dimensioning of shop fabricated items whether or not so required by each technical section.

1.11 INITIAL SUBMITTAL REQUIREMENTS

- A. As outlines in Sections 01 3300 and 01 5000, the General Contractor shall provide items noted including - bonds, insurance, emergency telephone numbers, progress scheduling, schedules of submittals, subcontractor listings and the like prior to the start of any work.

1.12 SCHEDULES

A. General

1. The objective of this project is to complete the overall work in the shortest period of time and to protect the building and occupants from damages caused by weather and construction activity during the progress of the work.
2. To meet these objectives, the Contractor shall plan the work, obtain materials, and execute the construction in the most expeditious manner possible in accordance with the requirements listed below.
3. If the Contractor fails to expedite and pursue any part of the work, the Owner may terminate the Contract.
4. The Contractor shall work in coordination with work of other Contractors and with school activities with special attention to noise, dust, safety and other contract requirements for work in and around the occupied buildings.

B. Milestone Schedule (See Section 01 1100).

1.13 DELAYS IN TIMEFRAME / TIME CHARGE

- A. The Contractor recognizes that time is of the essence for this Project and the date set for Final Completion shall be no later than the date indicated in their Contract Documents.
- B. Within four (4) calendar days from an occurrence of any such delay, The Contractor shall notify the Purchasing Director in writing as soon as he/she knows that the original Final Completion timeframe cannot be met. The Town shall have the right to agree to a new completion timeframe that will include working on Saturdays.
- C. The Contractor shall be liable for all additional cost (at the applicable District pay rates) incurred by the Owner to provide staff required to make the facility accessible to the Contractor, Consultants and Owner's representative as required to perform inspection after the contract completion date.
- D. All costs incurred by the Owner, and the cost of additional services and Owner's representative inspections will be subtracted from payment due the Contractor or, if the amount due the Contractor for payment is sufficient, the deficiency shall be paid by the Contractor to the Owner.

1.14 ADDITIONAL REQUIREMENTS

- A. The following are additional general and special requirements which will govern the work of the projects covered by these Documents.
1. If it appears that some of the work cannot be completed by the scheduled date, the Contractor shall increase the work force or increase the hours of work, including evenings and weekends as necessary, at no additional cost to the Owner.
 2. If the work is complete but the area is not cleaned and debris or equipment is not removed, the Owner shall have the right to prepare the area for occupancy with his own forces and deduct the costs from the Contract Amount. (If Contractor does not respond within 24 hours' notice).
 3. If the Contractor fails to staff the job adequately to meet the completion date, the Owner reserves the right to assume possession of the material and complete installation with the Owner's forces or other Contractors or to require the Contractor to work evenings and weekends at no additional cost (See Section 00 0301).
 4. The school can be made available on weekends and evenings to allow the Contractor adequate time to complete the work before final completion date. Any custodial cost resulting in this after hours scheduling will be the Contractor's responsibility.
 5. In addition to the above-stated requirements for phasing of the work, the General Contractor shall not do any noisy work in the areas where examinations will be conducted as per the published school calendar.
 6. Work in each work period shall progress at least at a pace in proportion to the Contract time available.
 7. The Contractor is responsible for temporary protection of all work until acceptance.
 8. The Schools will be closed on Saturdays, Sundays, regularly schedules District holidays, and at night after cleaning crews have finished.
 9. If any contractor wishes to work at any time when the school is normally closed, that Contractor shall arrange and pay for custodial services for the building at the applicable district pay rates.
 10. All existing conditions must be verified in the field. The Owner takes no responsibility for actual conditions found deviating from the drawings. If existing condition interferes with contract work, contractor is responsible to eliminate this condition.
 11. Contractor must plan, provide and maintain his own access, ramping, and egress as required into and out of the site, staging of trailer(s), materials, machinery, and equipment in agreement with the Owner. Maintain free and safe access on the jobsite

for other related project personnel. Maintain safe pedestrian or vehicular traffic must be regulated by a flagman. Trucking and delivery operation should be coordinated with Construction Manager's Superintendent and all other trades.

12. Contractors' proposed schedule must be approved by the Owner. Contractor shall indicate significant events such as submittals, shop drawings, material ordering, fabrication, delivery, coordination precedents, installation, testing and turnover by area or system as agreed with Owner. A revised progress status shall be required on a weekly basis.
13. Decisions required from the Owner, Architect and/or Engineer, shall be anticipated by the Contractor to provide ample time for inspection, investigation or detailed drawings.
14. Contractor shall limit his operations including storage of materials and prefabrication to areas within the Contract Limit Lines unless otherwise permitted by the Owner.
15. Contractor shall coordinate the use of premises with the Owner and Construction Manager and shall move at his own expense any stored products under Contractor's control, including excavated material, which interfere with operations of the Owner or separate contractors.
16. Contractor shall obtain and pay for the use of additional storage of work areas needed for operations.
17. Contractor shall assume full responsibility for the protection and safekeeping of products under this Contract stored on the site and shall cooperate with the Owner to insure security for the Owner's Property.
18. The intention of the work is to follow a logical sequence; however, the Contractor may be required by Owner to temporarily omit or leave out any section of his work, or perform his work out of sequence. All such out of sequence work and come back time to these areas shall be performed at no additional cost.
19. Contractor shall submit a two-week look ahead (man-loaded by work activity and area) to the Owner each week. Contractor's representative shall attend a weekly meeting with all contractors, chaired by the Architect, for the purpose of job coordination and sequencing. Contractor is responsible to coordinate the job with other trades and the Architect, and to cooperate with other trades in pursuit of the overall project's shop drawings and actively participate in resolving discrepancies, conflicts, interferences, etc.
20. Sufficient manpower shall be provided at all times to maintain progress of the job. A shortage of labor in the industry shall not be accepted as an excuse for not properly manning the job.
21. The Contractor shall take special care in verifying that his equipment matches the characteristics of the power being supplied.
22. Insubordination, unsafe practices, horseplay, abusive behavior or language, wanton

destruction of property, use of drugs or alcohol, possession of firearms, and solicitation shall not be tolerated. There will be no warnings, and Contractor shall designate a responsible on-site supervisor to handle any situations that may arise, including termination.

23. Contractor is responsible to supply and install all wood blocking/bracing necessary to properly secure their work. This responsibility includes coordinating the installation in concealed areas without delaying other trades.
24. Organize daily clean ups as well as participating in a weekly joint clean up involving all prime contractors on site. Clean up shall be considered a safety issue. All Contractors that do not participate in clean-up will have the work performed by others and their contract amount adjusted accordingly.
25. General Contractor shall provide protection from damage to adjacent and adjoining work and/or structures. Contractor shall clean, repair and/or replace any damage for which this contractor is responsible.
26. General Contractor shall submit hourly rate sheets that would apply to time and material work for all pertinent trades upon Award of Contract.
27. General Contractor shall examine surfaces and conditions prior to start of work. Report unacceptable conditions to the Architect. Do not proceed until unacceptable conditions are corrected and acceptable. Starting of work implies acceptance.
28. General Contractor shall include general housekeeping of light debris. All debris from will be collected daily and disposed of into dumpsters. Contractor shall provide a weekly broom sweep of all areas for the entire duration of the project. The broom sweep shall include debris from all trades working on site.
29. It is the responsibility of the General Contractor to review the entire Summary of Work and remaining documents for additional work items.
30. General Contractor shall coordinate with the Owner for lay down areas, staging areas, and overall use of project site.
31. All contractors and their employees, subcontractors and supplier are expressly prohibited from entering the occupied areas of the school buildings during school hours without prior written permission of the Owner and for using any of its facilities (i.e. restrooms, cafeteria, etc.).
32. Janitorial hourly wage rate to be charged to the Contractor for access to the building(s) on off work hours shall be \$45.00 per hour.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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WESTERN MIDDLE SCHOOL
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END OF SECTION 011000

SECTION 011100 – MILESTONE SCHEDULE**PART 1 - GENERAL**

1.1 MILESTONE

The following milestone schedule serves as a basis for bidding. A Master Schedule will be developed at a general meeting of the successful bidders within 7 days of Letter of Intent to Award the Contracts. General Contractor will coordinate activities, forward submittals, deliver materials and provide necessary manpower to meet the milestones listed below.

1.2 MILESTONE SCHEDULE

A. Start Date: Mobilization (start of regular full work day on site)

a. **June 28, 2021**

B. Completion Dates:

a. Substantial Completion: **August 13, 2021**

- i. Work shall be completed in accordance with the Contract Documents so that the Owner can occupy or use the Work or a portion thereof for its intended use.
- ii. If necessary, the Owner will allow the Contractor access to the building after regular school hours and on Saturdays at no additional cost for custodial O.T., only to complete all work necessary for Final Completion.
- iii. The Owner and Architect will make the determination whether the project is substantially complete.

b. Final Completion: **August 20, 2021**

- i. ALL WORK must be checked, tested and fully operational, and punch list complete.

! ALL WORK REQUIRED BY ANY OF THE OWNER'S REPRESENTATIVES AND CONSULTANTS, INCLUDING THE ARCHITECT, ARCHITECT'S CONSULTANTS, OWNER'S ATTORNEYS, ETC., TO EXECUTE FINAL CLOSE-OUT OF CONTRACT AFTER 60 DAYS BEYOND MILESTONE DATES IF DETERMINED TO BE CAUSED BY CONTRACTOR, SHALL RESULT IN PAYMENT(S) TO THE OWNER'S REPRESENTATIVES AND CONSULTANTS, INCLUDING THE ARCHITECT, ARCHITECT'S CONSULTANTS, OWNER'S ATTORNEYS, ETC., IN THE FORM OF A CHANGE ORDER DEDUCT TO THE BASE CONTRACT.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION (Not Used)**

END OF SECTION 011100

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 Sections:
 - 1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
 - 2. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

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 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 modifications 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. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager 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 Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if 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 qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Modify 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 upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: 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.
 - i. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 15 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: 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.
- k. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**
- l. **If a Contractor does propose a substitution for convenience within 15 days of notice to proceed, the Architect shall be compensated directly by the Contractor for the Architect's time reviewing such a request.**

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, within this specification.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: 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. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 5 days 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.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to 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 Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Recommended form is AIA Document G709 for Proposal Requests.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701 (or similar format).

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 (or similar format). 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.

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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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Allowances" for procedural requirements governing handling and processing of allowances.
 - 2. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
 - 3. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

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. Correlate 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. Submittals Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than fifteen (15) days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content: Use the 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 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.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. 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. Include evidence of insurance or bonded warehousing if required.
6. 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.
7. 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.
8. 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.

9. 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 shall be consistent with previous applications and payments as certified by Architect 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 period covered by each Application for Payment starts on the first day of each calendar month and ends with the last day of the same month.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect 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 of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 5 signed and notarized original copies of each Application for Payment to Architect 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.
- F. Waivers of Mechanic's Lien: Commencing with the second Application for Payment, with each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment. Waivers shall indicate partial release of lien with respect to that period of time covered by the preceding Application for Payment.
 1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

- a. Submit final Application for Payment with or preceded by 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 waivers of lien on forms, and executed in a manner, acceptable to Owner.
- G. 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.
 5. Schedule of unit prices.
 6. Submittals 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.
 16. Initial settlement survey and damage report if required.
- H. Application for Payment at Substantial Completion: After issuing 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 Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: 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 project coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Coordination drawings.
 - 4. Requests for Information (RFIs).
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Sections:
 - 1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information from each other during construction.

1.4 COORDINATION

- 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. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with 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 with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. 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.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities, and activities of other contractors 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.
 9. Project closeout activities.
- E. 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. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, 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 functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. 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. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. 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.
 - 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inch 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.
 - 8. Fire Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 - 9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.
 - 10. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files in accordance with the following requirements:
- 1. Upon issuance of a Notice to Proceed or similar authorization by the Owner, the Architect will transfer a copy of the current version of the digital model of the project to the Construction Manager's website for use by all trade contractors in preparing submittals and coordination drawings. The model was prepared using Revit 2013 software.
 - 2. All contractors using or accessing the digital Model shall first be required to execute a data licensing agreement in the form of AIA Document C106 Agreement form acceptable to the Owner and Architect. A fee of \$5,000 will be requested to gain access to the digital model.
 - 3. Over the course of the multi-year construction project, all contractors using or accessing the model shall be required to update their version of Revit to the latest available version of the software in general use at that time.
 - 4. File Preparation Format: RVT operating in Microsoft Windows operating system.
 - 5. File Submittal Format: Submit or post coordination drawing files using the same format as the file preparation or PDF format.

6. The Architect or his consultants make no representation as to the accuracy or completeness of the digital model as it relates to the drawings.
7. The Architect and his consultants shall be granted access to the coordination model on the Construction Manager's website for their use in conducting their construction administration responsibilities.

1.6 KEY PERSONNEL

- A. 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 email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 1. Post copies of list in project meeting room, in temporary field office, on Project designated Web site, and by each temporary telephone. Keep list current at all times.

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. 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 Construction Manager.
 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 solution(s) 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: AIA Document G716 Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. 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 Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.
- E. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site. Include the following:
 1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect and Construction Manager.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's and Construction Manager's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

- A. General: Construction Manager will 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, Construction Manager, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner 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, Construction Manager, 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. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Sustainable design requirements.
 - m. Preparation of record documents.
 - n. Use of the premises.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.

- y. First aid.
 - z. Security.
 - aa. 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, Construction Manager, 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:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. 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: Construction Manager will schedule and conduct a Project closeout conference, at a time convenient to Owner and Architect, but no later than 90 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, Construction Manager, 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 sustainable design documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Construction Manager will conduct progress meetings at weekly regular intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, 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) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
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.
- F. Coordination Meetings: Construction Manager will conduct Project coordination meetings at weekly regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, 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 meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined 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.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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 Sections:
 - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
- C. Action Submittals: Written and graphic information and physical samples that require Architect's [and Construction Manager's] responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.
- D. Informational Submittals: Written and graphic information and physical samples that do not require Architect's [and Construction Manager'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.
- E. 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.
- F. 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.

1.3 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 modifications to submittals noted by the Architect and Construction Manager and 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 start-up construction schedule. Include submittals required during the first 15 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 Construction Manager's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled dates for installation.
 - i. Activity or event number.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Architect can furnish Contractors access to the digital model of the Contract Drawings for use in preparing Shop Drawings, Coordination Drawings and Project record drawings.
1. Upon issuance of a Notice to Proceed or similar authorization by the Owner, the Architect will transfer a copy of the current version of the digital model of the project to the Construction Manager's website for use by all trade contractors in preparing submittals and coordination drawings. The model was prepared using Revit 2013 software.
 2. All contractors using or accessing the digital Model shall first be required to execute a data licensing agreement in the form of AIA Document C106 Agreement form acceptable to the Owner and Architect. A fee of \$5,000 will be requested to gain access to the digital model.

3. Over the course of the multi-year construction project, all contractors using or accessing the model shall be required to update their version of Revit to the latest available version of the software in general use at that time.
 4. File Preparation Format: RVT operating in Microsoft Windows operating system.
 5. File Submittal Format: Submit or post coordination drawing files using the same format as the file preparation or PDF format.
 6. The Architect or his consultants make no representation as to the accuracy or completeness of the digital model as it relates to the drawings.
 7. The Architect and his consultants shall be granted access to the coordination model on the Construction Manager's website for their use in conducting their construction administration responsibilities.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with the project phasing, fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - a. Transmit submittals only as required for the work of the current phase. Do not transmit submittals for work in subsequent phases prior to or concurrently with the submittals of the current phase. Submittals issued for work that is not in the current phase of construction will not be reviewed until all other submittals have been reviewed for the work in the current phase.
 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 Construction Manager 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 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 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.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Construction Manager, through Architect, before being returned to Contractor.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately **6 by 8 inches** on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Construction Manager.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file 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 Construction Manager].
4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Name of subcontractor.
 - h. Name of supplier.
 - i. Name of manufacturer.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Other necessary identification.
5. Include the following information as keywords in the electronic 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 the Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect or Construction Manager observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect and Construction Manager.
- I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Construction Manager will return submittals, without review, received from sources other than Contractor.
 1. Transmittal Form: Use CSI Form 12.1A.
 2. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.

- h. Specification Section number and title.
 - i. Indication of full or partial submittal.
 - j. Drawing number and detail references, as appropriate.
 - k. Transmittal number [numbered consecutively].
 - l. Submittal and transmittal distribution record.
 - m. Remarks.
 - n. Signature of transmitter.
3. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Construction Manager on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- J. 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 Construction Manager's action stamp.
- K. 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.
- L. Use for Construction: Use only final submittals that are marked with approval notation from Architect's and Construction Manager'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. Post electronic submittals as PDF electronic files directly to Construction Manager's FTP site specifically established for Project.
 - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Action Submittals: Submit two paper copies of each submittal, unless otherwise indicated. Architect, will not return paper copies.
 - 3. Informational Submittals: Submit two paper copies of each submittal, unless otherwise indicated. Architect and Construction Manager will not return copies.
 - 4. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

5. 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.
 6. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- 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. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. 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.
 - b. Two paper copies of Product Data, unless otherwise indicated. Architect will not return paper copies.
- 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, unless submittal based upon Architect's digital data drawing files is otherwise permitted.
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. Two opaque copies of each submittal. Architect will not return paper copies.
- 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.
 3. 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.
 4. 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 Construction Manager, will return one submittal with options selected.
 5. 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 Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.
 - 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].
 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. Two paper copies of product schedule or list, unless otherwise indicated. Architect will not return paper copies.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. 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. Use CSI Form 1.5A.
 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.
 4. Submit subcontract list in the following format:
 - a. Number of Copies: Three paper copies of subcontractor list, unless otherwise indicated. Architect, through Construction Manager, will return two copies.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- K. 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.
- L. 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 American Welding Society (AWS) forms. Include names of firms and personnel certified.
- M. 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.
- N. 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.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. 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.
- R. Product Test Reports: Submit written reports indicating 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.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. 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.
- W. Field Test Reports: Submit 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.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. 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 three 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 Construction Manager.

- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "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 CONSTRUCTION MANAGER'S ACTION

- A. General: Architect and Construction Manager will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect and Construction Manager will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.
- E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

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, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections:
 - 1. Divisions 02 through 49 Sections for specific test and inspection requirements.

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 Construction Manager.
- 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 the 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 the 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, i.e., 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 or trades.
- 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 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. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
 - 1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.
 - 2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. 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 shall not have other Project responsibilities.
- 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: Include in quality-control plan 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 to those indicated for this Project in material, design, and extent.
- 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. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

- c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, mockups, do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, through Construction Manager, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.
 2. Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at the Project.
 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 5. Obtain Architect's and Construction Manager's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed, unless otherwise indicated.
 - L. Integrated Exterior Mockups: Construct integrated exterior mockup in accordance with approved Shop Drawings as indicated on 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, and the Contract Sum will be adjusted by Change Order.
- 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 24 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 Division 01 Section "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, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, 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.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of the Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .
1. Distribution: Distribute schedule to Owner, Architect, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
- 1.11 SPECIAL TESTS AND INSPECTIONS
- A. Special Tests and Inspections: Owner will engage a qualified testing agency special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections included in the project manual, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and in Statement of Special Inspections included in the project manual, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, through Construction Manager, with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. 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 modifications as they occur. Provide access to test and inspection log for Architect's and Construction Manager'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 Division 01 Section "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 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls.
- B. Temporary utilities include, but are not limited to, the following:

- 1. Electric power service.
- 2. Lighting.
- 3. Telephone service.
- 4. Water Service
- 5. Sanitary Facilities.
- 6. Protection Facilities.

1.3 USE CHARGES

- A. Temporary Utilities Service: With the exception of toilet facilities and telephone service, the owner will pay for service use charges for usage of temporary utilities, by all parties engaged in construction, at Project site for construction operations for this project.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 - 2. 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.

1.5 PROJECT CONDITIONS

- A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Provide materials suitable for use intended.
- B. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- B. Sanitary Facilities: Contractor shall provide temporary toilets, wash facilities and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- C. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Lighting: If required, provide temporary lighting that provides adequate illumination to allow for safe working conditions during normal working hours.

3.2 TEMPORARY FACILITIES INSTALLATION

- A. Lighting: If required, provide temporary lighting that provides adequate illumination for construction operations and traffic conditions.

- B. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed in accordance with procedures approved by the architect.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas as required.
 - b. Maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 OPERATION, TERMINATION, AND REMOVAL

- A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended.
 - 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "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 Sections:
 - 1. Division 01 Section "Substitution Procedures" for requests for substitutions.

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 Construction Manager 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 Division 01 Section "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 Division 01 Section "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. Store 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. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

- C. Submittal Time: Comply with requirements in Division 01 Section "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 or a comparable product. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or comparable source that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**
3. Products:
 - a. Product 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 will be considered during the bid period. **If a product selected from the list of names is other than the Basis of Design indicated OR IT IS A COMPARABLE PRODUCT, the Contractor shall be solely responsible for verifying that the product does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the product does require a change in any of the items**

noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to not providing the Basis of Design product.

4. Manufacturers:

- a. Manufacturer List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products will be considered during the bid period. **If a manufacturer selected from the list of names is other than the Basis of Design indicated OR IT IS A COMPARABLE PRODUCT, the Contractor shall be solely responsible for verifying that the product does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the manufacturer does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to not providing the Basis of Design manufacturer.**

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, provide the specified or indicated product or a comparable product. 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. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**

- 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 Division 01 Section "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. **If a comparable product or substitution is proposed, the Contractor shall be solely responsible for verifying that the substitution does not impact the structural design, HVAC, electrical, plumbing or utility requirements, clearances, dimensions or layouts, building or fire code requirements or any other change in the original design. If the substitution does require a change in any of the items noted above or similar design change or physical changes, the contractor shall be responsible for the cost of any redesign and for the additional construction costs associated with the changes due to the substitution.**
 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.
 6. **If a Contractor proposes using a comparable product for an item that only listed one product or manufacturer, the Architect will consider the request in the bidding period and during the scope reviews after the bidding period before award of contract at no cost to the Contractor. If the request is made after award of contract, the Architect shall be compensated directly by the Contractor for the Architect's time reviewing the proposal.**
 7. **If a Contractor proposes using a comparable product for an item that listed at least three products or manufacturers, the Architect will consider the request in the bidding period at no cost to the Contractor. If the request is made after the bidding period, the Architect shall be compensated directly by the Contractor for the Architect's time reviewing the proposal.**

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. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting surveys.
 - 2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 3. Division 07 Section "Penetration Firestopping System" 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. Qualification Data: For land surveyor, and professional engineer.

- B. Certificates: Submit certificate signed by land surveyor, or professional engineer certifying that location and elevation of improvements comply with requirements.
- C. 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 how long services and systems will be disrupted.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by land surveyor, or professional engineer.
- F. Final Property Survey: Submit 5 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. 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 the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - a. Applies to all structural elements.
 - 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. Conveying systems.
 - i. Electrical wiring systems.
 - j. 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, which results in reducing their capacity to perform as intended, or that result 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. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 - f. 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.
- C. 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.
- D. 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.
- 1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."
- 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 the 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, including 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. 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 local utility 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 the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor or professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 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 (2440 mm) in occupied spaces and 90 inches (2300 mm) 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. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. 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.
- G. 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.
- H. 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.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 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. Temporary Support: Provide temporary support of work to be cut.

- C. 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.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."
- E. 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.
- F. 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. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 - 5. 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.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- G. 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.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 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. Utilize containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.
- 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 Division 01 Section "Temporary Facilities and Controls" or Division 01 Section "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.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "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 Division 01 Section "Quality Requirements."

3.10 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.

3.11 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

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 surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. 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. Operating elements include the following:
 - 1. Primary operational systems and equipment.
 - 2. Mechanical systems piping and ducts.
 - 3. Control systems.
 - 4. Communication systems.
 - 5. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related 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. Miscellaneous elements include the following:

1. Equipment supports.
 2. Piping, ductwork, vessels, and equipment.
 3. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut. Provide temporary dams to contain water and moisture.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Protect fixtures and personal property on other occupied floors in building from moisture, dust and impact damage.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

- A. 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. 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 as small as possible, neatly to 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 / 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.
- C. 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 possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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 eliminate 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, apply primer and intermediate paint coats 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.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

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.
- B. Related Sections:
 - 1. Division 01 Section "Execution" for progress cleaning of Project site.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 5. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Include copy of final payment application and Consent of Surety to Final Payment.
 - 5. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

6. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 8. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 9. Complete startup testing of systems.
 10. Submit test/adjust/balance records.
 11. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 12. Advise Owner of changeover in heat and other utilities.
 13. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 14. Complete final cleaning requirements, including touchup painting.
 15. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect [and Construction Manager] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report and warranty.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect [and Construction Manager] 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.

1.5 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.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
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 Construction Manager.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the following format:
 - a. PDF electronic file.
 - b. [Three] paper copies of product schedule or list, unless otherwise indicated. Architect[, through Construction Manager,] will return [two] <Insert number> copies.

1.6 WARRANTIES

- A. Submittal Time: 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.
- 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 the 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 (215-by-280-mm) 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. 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 table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

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 the specified 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 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.

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- 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; shampoo if visible soil or stains remain. Vacuum all carpeted and soft surfaces with a high-efficiency particulate arrestor (HEPA) vacuum. For phased or occupied renovations, HEPA vacuum the carpet daily in occupied areas.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report upon completion of cleaning.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls," and Division 01 Section "Construction Waste Management and Disposal."

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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 Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Division 01 Section "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.
 - 3. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

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. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:

1. Three 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. Architect and Commissioning Agent 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. Architect and Commissioning Agent will return copy with comments.
 1. Correct or modify each manual to comply with Architect's and Commissioning Agent's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Agent's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. List of Manufacturers
 5. List of Vendors
 6. List of Subcontractors
 7. 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 Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Agent.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- 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 upon 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 upon 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 (215-by-280-mm) 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, and 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 (215-by-280-mm) 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 is 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 Division 01 Section "Project Record Documents."
- G. Comply with Division 01 Section "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 Sections:
 - 1. Division 01 Section "Execution" for final property survey.
 - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit three (3) sets of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal: Submit one paper copy set, and one PDF electronic files of marked-up record prints and one sets of plots from corrected record digital data files. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal: Submit three paper copies sets, and one PDF electronic files of marked-up record prints. Print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit three paper copies and one annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit one paper copy and one 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: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy and one annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated in Project record documents concurrent with progress of the Work, including modifications, 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.
 - 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 Work 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. Utilize 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 and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Upon issuance of a Notice to Proceed or similar authorization by the Owner, the Architect will transfer a copy of the current version of the digital model of the project to the Construction Manager's website for use by all trade contractors in preparing submittals, coordination drawings and record drawings. The model was prepared using Revit 2013 software.
 2. All contractors using or accessing the digital Model shall first be required to execute a data licensing agreement in the form of AIA Document C106 Agreement form acceptable to the Owner and Architect. A fee of \$5,000 will be requested to gain access to the digital model.
 3. Over the course of the multi-year construction project, all contractors using or accessing the model shall be required to update their version of Revit to the latest available version of the software in general use at that time.
 4. File Preparation Format: RVT operating in Microsoft Windows operating system.
 5. File Submittal Format: Submit or post coordination drawing files using the same format as the file preparation or PDF format.
 6. The Architect or his consultants make no representation as to the accuracy or completeness of the digital model as it relates to the drawings.
 7. The Architect and his consultants shall be granted access to the coordination model on the Construction Manager's website for their use in conducting their construction administration responsibilities.
- 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 Construction Manager.
 - 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 modifications to project record documents as they occur; do not wait until the 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 017900 - DEMONSTRATION AND TRAINING

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 instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Date of video recording.
 - 2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.

3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
4. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper and PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.

- c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.8 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.9 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.

- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode.
 - 1. Submit video recordings on CD-ROM or thumb drive.
 - 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. Email address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 - 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
 - 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

GREENWICH PUBLIC SCHOOLS

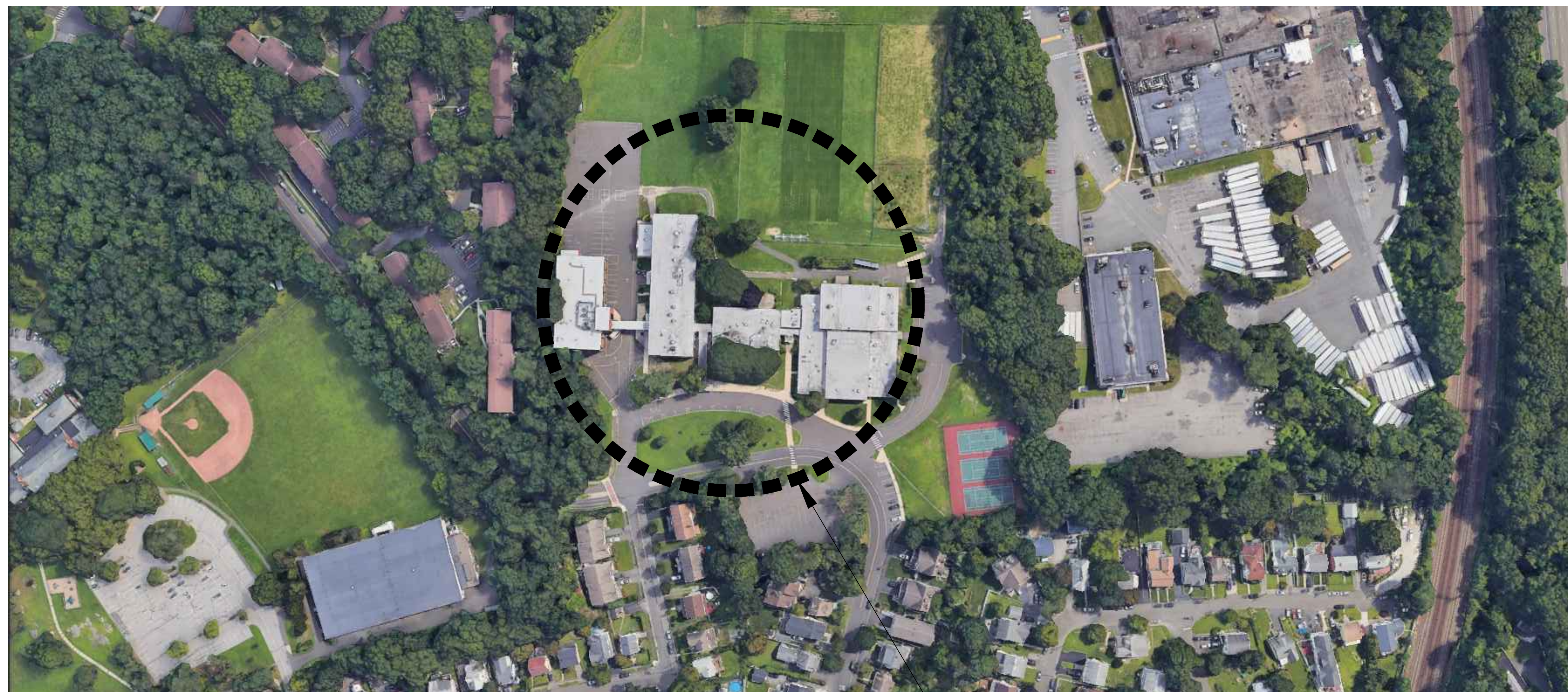
AUDITORIUM AC UPGRADE - 2020

WESTERN MIDDLE SCHOOL

100% CONSTRUCTION DOCUMENTS

NOVEMBER 13, 2020

AKF JOB NUMBER: 190911-000



GREENWICH PUBLIC SCHOOLS
WESTERN MIDDLE SCHOOL
1 WESTERN JR. HWY,
GREENWICH, CT 06830

OWNER:

Greenwich Public Schools

290 GREENWICH AVENUE
GREENWICH, CT 06830

MEP CONSULTANT:

AKF ENGINEERS, LLP

ONE AUDUBON
NEW HAVEN, CT 06511

AKF

MECHANICAL SYMBOL LIST

DUCTWORK

(NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT)

	SINGLE LINE DUCTWORK OR EQUIPMENT – NEW
	SINGLE LINE DUCTWORK OR EQUIPMENT – EXISTING
	DUCTWORK TO BE REMOVED
	DUCTWORK WITH ACOUSTIC LINING
	DUCT UNDER POSITIVE PRESSURE (SUPPLY AIR OR FAN DISCHARGE)
	DUCT UNDER NEGATIVE PRESSURE (RETURN AIR)
	DUCT UNDER NEGATIVE PRESSURE (EXHAUST)
	CUBIC FEET PER MINUTE
	DIAMETER
	TYPE A CEILING DIFFUSER 400 CFM SUPPLY AIR
	RECTANGULAR CEILING DIFFUSER WITH 12"x2" NECK 400 CFM SUPPLY AIR
	TYPE A CEILING RETURN GRILLE/CEILING EXHAUST GRILLE, 400 CFM RETURN/EXHAUST AIR
	10"x8" CEILING RETURN GRILLE/CEILING EXHAUST GRILLE, 300 CFM RETURN/EXHAUST AIR
	RECTANGULAR DIFFUSER WITH BLANKING PLATE
	VANED ELBOW (SEE DETAIL) OR RADIUS ELBOW
	RADIUS ELBOW
	CARBON DIOXIDE SENSOR
	THERMOSTAT
	HUMIDISTAT
	DUCT SMOKE DETECTOR

PIPING

(NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT)

	NEW PIPE WITH DIRECTION OF FLOW
	EXISTING PIPING
	EXISTING PIPING TO BE REMOVED
	PIPE DROP
	PIPE RISE
	GATE VALVE
	GLOBE VALVE
	NEEDLE VALVE COCK
	DRAIN VALVE
	LOCK SHIELD VALVE
	CHECK VALVE, SWING OR LIFT
	FLEXIBLE CONNECTOR
	BUTTERFLY VALVE
	BALL VALVE
	SQUARE HEAD COCK
	BALANCING VALVE
	PLUG VALVE (TYPE AS NOTED)
	AUTOMATIC CONTROL VALVE
	FLOW CONTROL VALVE
	SOLENOID VALVE
	"Y" TYPE STRAINER WITH BLOWOFF VALVE AND CAP
	SINGLE BASKET STRAINER
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	THERMOMETER WELL
	THERMOMETER AND WELL

STEAM SERVICES

(NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT)

	RELIEF VALVE
	SYPHON
	TRAP (TYPE AS NOTED)
	LOW PRESSURE DRIP ASSEMBLY
	LOW PRESSURE CONDENSATE RETURN
	LOW PRESSURE STEAM
	PUMPED CONDENSATE

HVAC EQUIPMENT DESIGNATIONS

	TAG LETTER [DENOTES MULTIPLE UNITS OF THE SAME TYPE]
	EQUIPMENT TAG NUMBER
	EQUIPMENT DESIGNATION (REFER TO SPECIFIC TRADE LIST)
	UNIT D
	UNIT TYPE 2
	FAN COIL UNIT (REFER TO LIST)

GENERAL

(NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT)

	POINT OF CONNECTION
	POINT OF DISCONNECTION
	DIRECT DIGITAL CONTROL PANEL

GENERAL NOTES

- GENERAL NOTES, SYMBOL LIST AND DETAILS ARE APPLICABLE TO ALL HVAC/MECHANICAL DRAWINGS.
- ALL WORK IS NEW UNLESS OTHERWISE NOTED.
- DRAWINGS ARE DIAGRAMMATIC. DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD. RELOCATE EXISTING WORK THAT INTERFERES WITH WORK OF THIS CONTRACT.
- COORDINATE THIS WORK WITH THAT OF OTHER TRADES.
- DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL EXCEPT IN WAY OF STRUCTURAL STEEL, DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.
- NEITHER ACCURACY NOR COMPLETION OF SERVICES AND UTILITY LOCATIONS SHOWN ON DRAWINGS IS GUARANTEED. DETERMINE EXACT LOCATIONS OF EXISTING SERVICES AND UTILITIES IN FIELD, WHETHER OR NOT SHOWN ON DRAWINGS. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM WORK OF THIS SECTION.
- MANUFACTURERS MODEL NUMBERS ARE SPECIFIED SOLELY TO ESTABLISH STANDARDS OF QUALITY FOR PERFORMANCE AND MATERIALS.
- PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURERS RECOMMENDATIONS.
- PROVIDE ACCESS PANELS FOR EQUIPMENT THAT REQUIRES PERIODIC SERVICE.
- PROVIDE HANGERS, INSERTS, ANCHORS, SUPPLEMENTAL STEEL & SUPPORTS AS REQUIRED TO SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM STRUCTURE.
- SCHEDULE WORK OF THIS SECTION TO AVOID INTERFERING WITH EXISTING OPERATIONS IN THE FACILITY.
- COORDINATE ROOF PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. MECHANICAL CONTRACTOR TO NOTIFY OWNER PRIOR TO STARTING WORK TO VERIFY COMPLIANCE WITH BOND AND WARRANTY OF EXISTING ROOF.
- RUN DUCTS AND PIPING CONCEALED, UNLESS OTHERWISE SPECIFIED AND CLEAR OF CEILING INSERTS.
- INSTALL THERMOSTATS 4'-6" ABOVE FINISHED FLOOR OR AS DIRECTED OTHERWISE BY ARCHITECT.
- STRUCTURAL WELDING SHALL BE CONTINUOUS 1/4" FILLET UNLESS REQUIRED OTHERWISE.

AIR SYSTEMS

- INTERNAL AIRFLOW DIMENSIONS ARE SHOWN FOR DUCTS. INCREASE DUCT SIZE AS NECESSARY TO MAINTAIN FREE FLOW AREA INDICATED.
- USE FLAT TRANSVERSE SEAM FOR DUCTWORK WHERE SPACE AVAILABLE DICTATES.
- PROVIDE VOLUME DAMPERS OR OTHER APPROVED BALANCING DEVICES AT DUCT BRANCHES AND RUN OUTS, AND AT REGISTER GRILLE AND DIFFUSER NECKS IN SUPPLY, RETURN AND EXHAUST DUCTWORK WHETHER SHOWN OR NOT.
- DUCTWORK DOWNSTREAM OF ALL AIR HANDLING UNITS SHALL BE ACOUSTICALLY LINED WITH 1" ACOUSTICAL LINING FOR A MINIMUM OF 10 FEET.
- PROVIDE 36" CLEARANCE IN FRONT OF ALL ELECTRIC CONTROL PANELS PER N.E.C. AND MFG. REQUIREMENTS.
- PROVIDE DUCT TRANSITIONS FROM AIR HANDLER INLET/OUTLET DUCT WORK AT SIZES INDICATED TO AIR HANDLER INLET/OUTLET UNIT CONNECTIONS.

PIPING SYSTEMS

- PITCH PIPING 1" IN 20' IN DIRECTION OF FLOW.
- PROVIDE TRAPS IN CONDENSATE LINES THAT EXTEND OVER 2'.

ABBREVIATIONS

(NOT ALL ABBREV. ARE NECESSARILY USED ON THIS PROJECT)

A	AMPERES	LDB	LEAVING DRY BULB TEMPERATURE
AAV	AUTOMATIC AIR VENT	LF, LIN.FT.	LINEAR FEET
AC	AIR CONDITIONING	LL	REFRIGERANT LIQUID LINE
ACCU	AIR COOLED CONDENSING UNIT	LR	LINEAR RETURN
ACS	AUTOMATIC CONTROL SYSTEM	LRA	LOCKED ROTOR AMPS
ACU	AIR CONDITIONING UNIT	LWB	LEAVING WET BULB TEMPERATURE
AD	ACCESS DOOR	LWT	LEAVING WATER TEMPERATURE
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
AHU	AIR HANDLING UNIT	MB	MIXING BOX
AL	ALUMINUM	MBH	THOUSAND BTU PER HOUR
BF	BOOSTER FAN	MHP	MOTOR HORSEPOWER
BGE	BOTTOM EXHAUST GRILLE	MIN	MINIMUM
BGR	BOTTOM RETURN GRILLE	MM	MILLIMETER
BHP	BRAKE HORSEPOWER	MOT	MOTOR
BIDW	BACKWARD INCLINE DOUBLE WIDTH	MOV	MOTOR OPERATED VALVE
BISW	BACKWARD INCLINE SINGLE WIDTH	NC	NORMALLY CLOSED
BMS	BUILDING MANAGEMENT SYSTEM	NIC	NOT IN CONTRACT
BRS	BOTTOM SUPPLY REGISTER	N.O.	NORMALLY OPEN
BT	BOTTOM THROAT	NO.	NUMBER
BTU	BRITISH THERMAL UNIT	NTS	NOT TO SCALE
BTUH	BTU PER HOUR	OA	OUTSIDE AIR
°C	DEGREES CENTIGRADE (CELSIUS)	P	PUMP
CC	COOLING COIL	PD	PRESSURE DROP
CCW	COUNTER CLOCKWISE	PHC	PREHEAT COIL
CD	CEILING DIFFUSER	PSI	POUNDS PER SQUARE INCH
CFFC	CAP FOR FUTURE CONNECTION	PSIA	PSI ABSOLUTE
CFM	CUBIC FEET PER MINUTE	PSIG	PSI GAUGE
CG	CEILING GRILLE	PVC	POLYVINYL CHLORIDE
CLG	CEILING	RA	RETURN AIR
COND	CONDENSATE	(RE)	RELOCATED EXISTING
CP	CONDENSATE PUMP	RF	RETURN FAN
CR	CEILING REGISTER	RH	RELATIVE HUMIDITY
CU IN	CUBIC INCHES	RHC	REHEAT COIL
CUH	CABINET UNIT HEATER	RHWP	REHEAT WATER PUMP
CV	CONSTANT VOLUME	RM	ROOM
CW	CLOCKWISE	RPM	REVOLUTIONS PER MINUTE
CWP	CONDENSER WATER PUMP	(RRO)	EXISTING TO BE REMOVED AND RETURN TO OWNER
DB	DRY BULB	RG	REFRIGERANT GAS LINE
DX	DIRECT EXPANSION	SA	SUPPLY AIR
DIAM	DIAMETER	SAU	SOUND ATTENUATION UNIT
DWPR	DAMPER	SD	SMOKE DAMPER
DN	DOWN	SF	SUPPLY FAN
(E)	EXISTING TO REMAIN	SL	REFRIGERANT SUCTION LINE
EA	EACH	SP	STATIC PRESSURE
EAT	ENTERING AIR TEMPERATURE	T	THROAT
EDB	ENTERING DRY BULB TEMPERATURE	TDH	TOTAL DYNAMIC HEAD
EF	EXHAUST FAN	TEMP	TEMPERATURE
ELEC	ELECTRIC	TGE	TOP EXHAUST GRILLE
EDH	ELECTRIC DUCT HEATER	TGR	TOP RETURN REGISTER
EO	EQUAL	TRD	TRANSFER DUCT
(ER)	EXISTING TO BE REMOVED	TRF	TRANSFER FAN
(ERR)	EXISTING TO BE REMOVED & RELOCATED	TRG	TRANSFER GRILLE
EUH	ELECTRIC UNIT HEATER	TRS	TOP SUPPLY REGISTER
EWB	ENTERING WET BULB	TT	TOP THROAT
EWT	ENTERING WATER TEMPERATURE	TYP	TYPICAL
EXH	EXHAUST	TX	TOILET EXHAUST
EXIST	EXISTING	UON	UNLESS OTHERWISE NOTED
°F	DEGREES FAHRENHEIT	UH	UNIT HEATER
FA	FREE AREA (SQ.FT.)	V	VOLTS
FC	FLEXIBLE CONNECTION	W	WIDTH
FCU	FAN COIL UNIT	W/	WITH
FD	FIRE DAMPER	W/O	WITHOUT
FIN FL	FINISHED FLOOR	WB	WET BULB
FLA	FULL LOAD AMPERES	WG	WATER GAUGE
FPM	FEET PER MINUTE	WMS	WIRE MESH SCREEN
FPS	FEET PER SECOND	WSP	WORKING STEAM PRESSURE
FR	FLOOR REGISTER		
FT	FEET		
FV	FACE VELOCITY		
GPM	GALLONS PER MINUTE		
GX	GENERAL EXHAUST		
H	HUMIDIFIER		
HALX	HALON EXHAUST		
HC	HEATING COIL		
HD	HEAD		
HGR	HOT GAS REHEAT		
HR	HOUR		
HT	HEIGHT		
HWP	HOT WATER PUMP		
HV	HEATING AND VENTILATING		
HX	HEAT EXCHANGER		
IN	INCH OR INCHES		
IPS	IRON PIPE SIZE		
KW	KILOWATT		
L	LENGTH		
LAT	LEAVING AIR TEMPERATURE		
LBS	POUNDS		
LD	LINEAR DIFFUSER		

DEMOLITION NOTES

- GENERAL
 - THIS CONTRACTOR SHALL VISIT THE SITE AND ADJOINING AREAS AND EXAMINE THE EXISTING CONDITIONS TO BECOME FAMILIAR WITH THEM AND TO DETERMINE THE DIFFICULTIES WHICH WILL AFFECT THE EXECUTION OF THE WORK OF THIS CONTRACT. THIS CONTRACTOR SHALL PERFORM THIS PRIOR TO THE SUBMISSION OF HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
 - THE DEMOLITION WORK SHALL INCLUDE, PROVIDING ALL MATERIALS, ALL NECESSARY EXTENSIONS, CONNECTIONS, CUTTING, REPAIRING, ADAPTING AND OTHER MECHANICAL WORK REQUIRED, TOGETHER WITH ANY REQUIRED TEMPORARY CONNECTIONS TO MAINTAIN SERVICE PENDING THE COMPLETION OF THE PERMANENT WORK. NOTES AND GRAPHIC REPRESENTATION SHALL NOT LIMIT THE EXTENT OF DEMOLITION REQUIRED. EXTENT OF DEMOLITION WORK SHALL BE COORDINATED WITH THE ARCHITECT AND BUILDING MANAGEMENT.
- SCOPE OF WORK
 - EXISTING WORK INTERFERING WITH NEW.
 - ALL EXISTING WORK REQUIRED TO REMAIN BUT INTERFERING WITH PROPOSED NEW MECHANICAL (AS WELL AS ELECTRICAL AND GENERAL CONSTRUCTION WORK) SHALL BE RELOCATED AND RECONNECTED USING MATERIALS CONFORMING TO STANDARDS OF THIS CONTRACT.
 - REMOVAL OF MECHANICAL EQUIPMENT DUCTWORK AND PIPING.
 - REMOVE ALL EXISTING FLOOR MOUNTED UNITS AND DEVICES WITH ALL ASSOCIATED DUCTWORK, HANGERS AND ACCESSORIES, INCLUDING HOUSEKEEPING PADS.
 - REMOVE ALL EXHAUST, RETURN AND TRANSFER FANS AND ASSOCIATED DUCTWORK IN THE MECHANICAL ROOM.
 - REMOVE ALL PIPING, VALVING AND HANGERS ASSOCIATED WITH PIPING TO BE REMOVED BACK TO MAINS. IDENTIFY ALL PIPING BY SERVICE TYPE AND CAP AT MAINS.
 - REMOVE ALL CONTROLS, VALVES AND ASSOCIATED ACCESSORIES.
 - REMOVE ALL STARTERS, DISCONNECT SWITCHES, MOTORS, CONTROL (BOTH TEMPERATURE AND SYSTEM CONTROL) BACK TO MAIN PANELS AND CAP AT PANEL. COORDINATE WITH ELECTRICAL CONTRACTOR BEFORE REMOVAL OF ANY ELECTRICAL POWERED EQUIPMENT. ELECTRICAL CONTRACTOR IS TO DISCONNECT ALL POWER TO SUCH EQUIPMENT.
 - REMOVAL OF DUCTWORK AND ACCESSORIES
 - REMOVE ALL SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK WITH ALL ASSOCIATED COLLARS, DAMPERS, AND CONTROLS AS NOTED ON DRAWINGS.
 - CONTRACTOR TO CONTACT DISTRICT MANAGEMENT REGARDING SYSTEM REMOVAL SCOPE OF WORK TO ENSURE THAT SPACES THAT ARE TO STAY OPERATIONAL ARE NOT AFFECTED BY REMOVALS OF THE SYSTEM.
 - ALL EXISTING BUILDING FIRE DAMPERS, FIRE/SMOKE DAMPERS, DUCT MOUNTED SMOKE DETECTORS AT SUPPLY AND RETURN TO REMAIN.
 - CONTRACTOR TO REPLACE/ PATCH WALLS AND FLOORS TO MATCH EXISTING.
 - PROVIDE ADDITIONAL SUPPORT FOR ALL EXISTING DUCTS AND PIPING TO REMAIN WHICH ARE AFFECTED BY DEMOLITION OF EXISTING CEILING AND PARTITIONS.
 - ALL MATERIALS AND EQUIPMENT REMOVED AS A RESULT OF DEMOLITION SHALL BE TAKEN FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS.
 - CONTRACTOR SHALL IDENTIFY ALL EXISTING WORK TO REMAIN BY ACCEPTABLE IDENTIFICATION MEANS TO CONFIRM PROPER SCOPE PRIOR TO COMMENCEMENT OF DEMOLITION.

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1	07/22/19	100% SD FOR REVIEW
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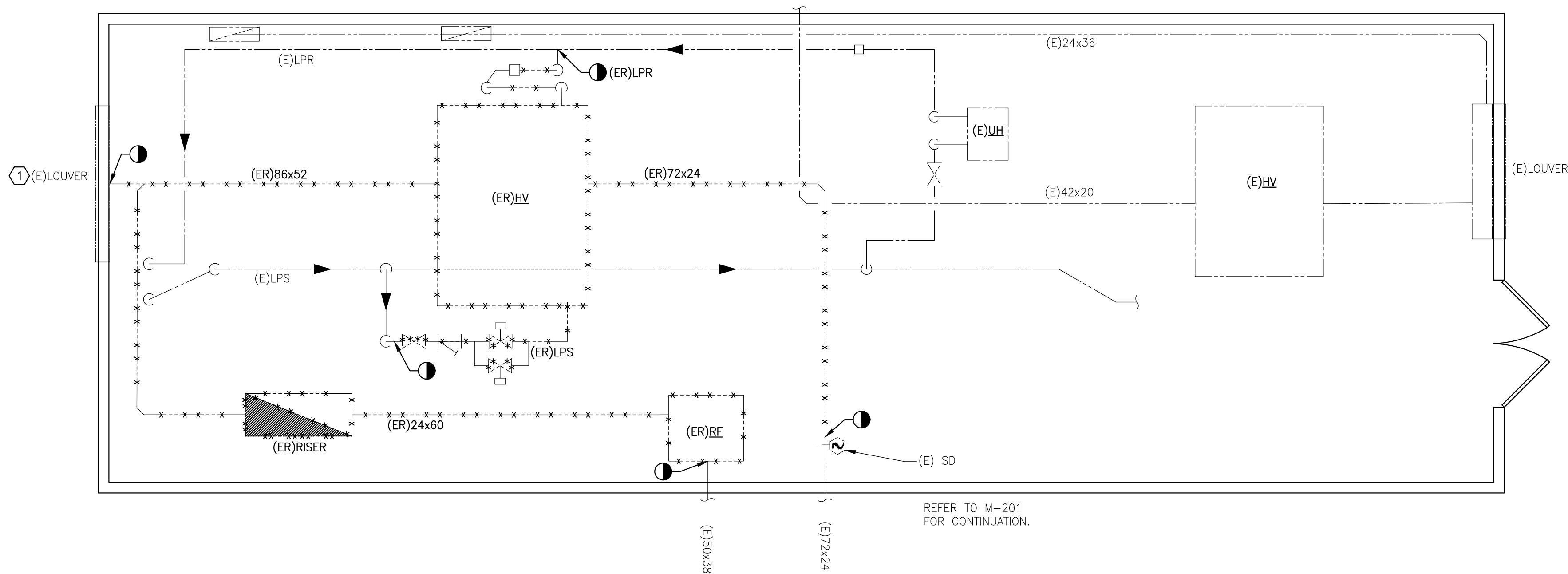
PROJECT
Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING TITLE
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COVER SHEET**

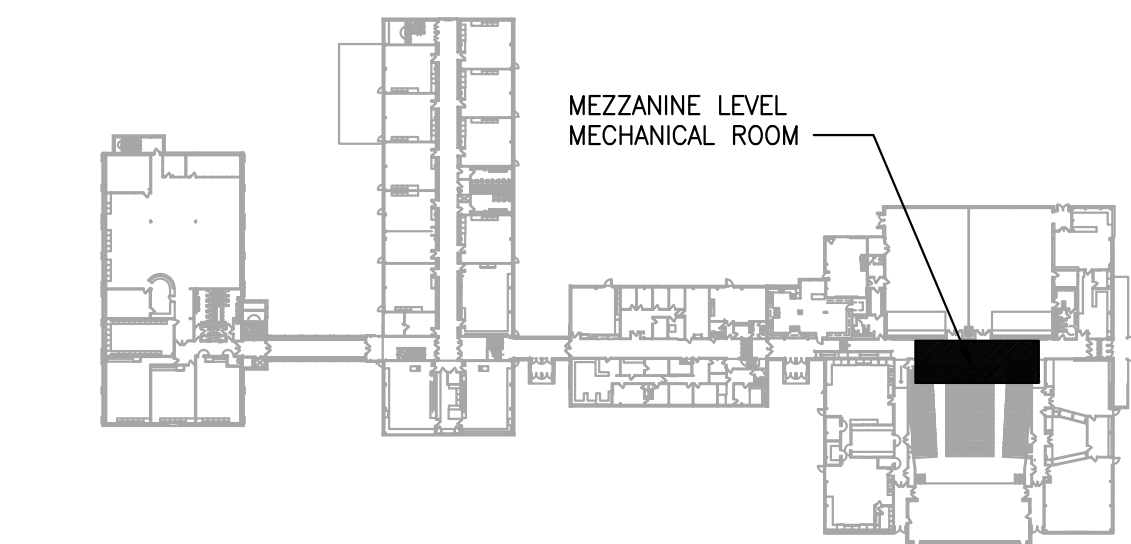
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1 PART PLAN-MEZZANINE LEVEL MER



FIRST FLOOR PLAN
SCALE: NTS

DRAWING NOTES:

1. THE MECHANICAL DRAWING SHOWS THE SCOPE OF THE EXISTING MECHANICAL DEMOLITION WORK AND DOES NOT SHOW EVERY DEVICE, ACCESSORY, PIPE, PAD, WIRE, ETC. TO BE REMOVED.

KEY NOTES:

- 1 BLANK-OFF LOUVER WITH SHEET METAL AND RIGID INSULATION.

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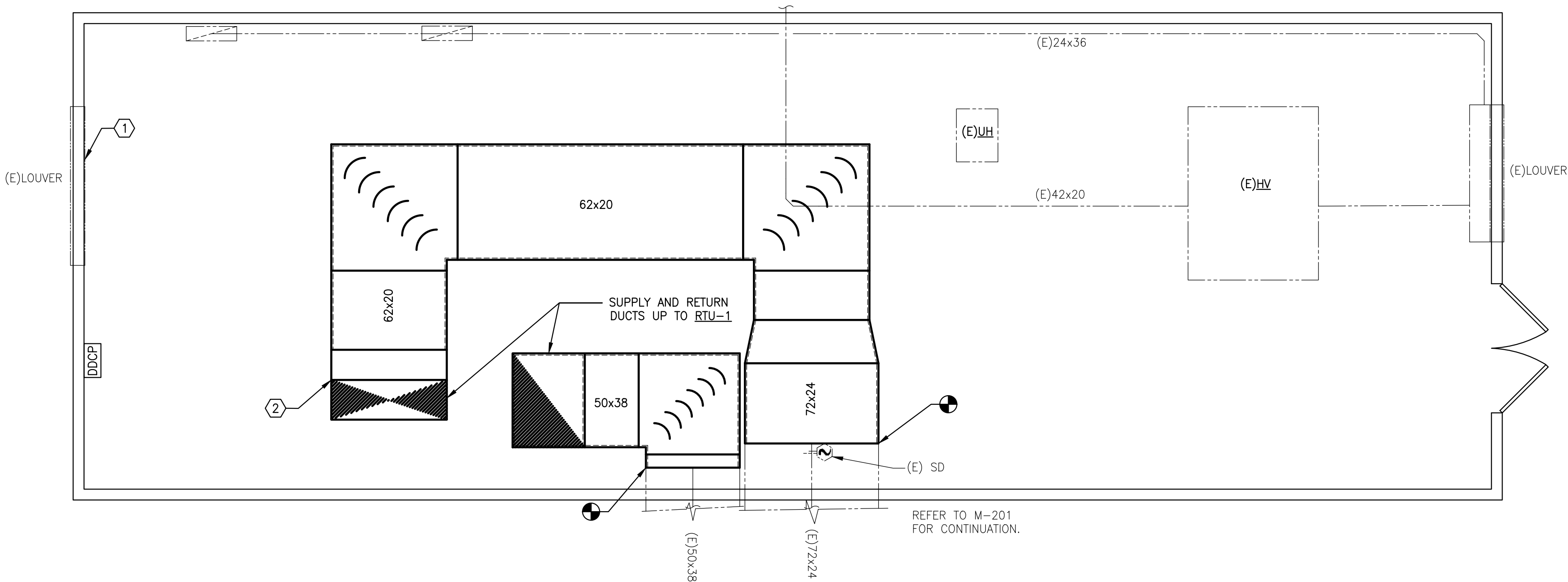
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PROJECT
Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

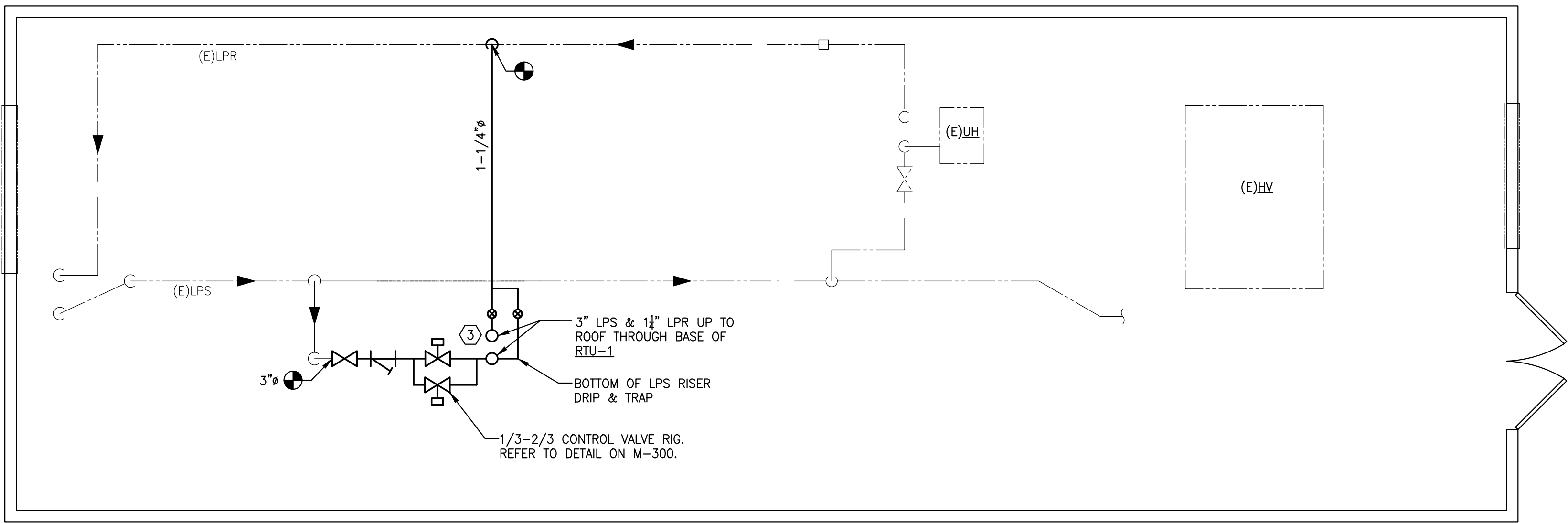
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**MECHANICAL
FLOOR PLAN -
DEMOLITION**

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Checked By	JM	M-100
Date	11/13/2020	
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Project No.	190911-000	

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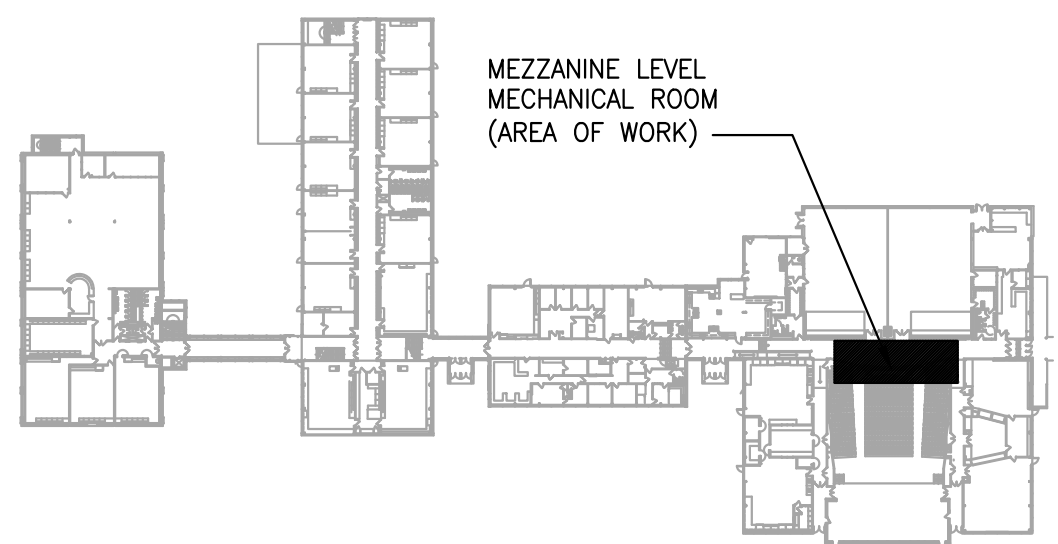


1 MEZZANINE LEVEL- DUCTWORK



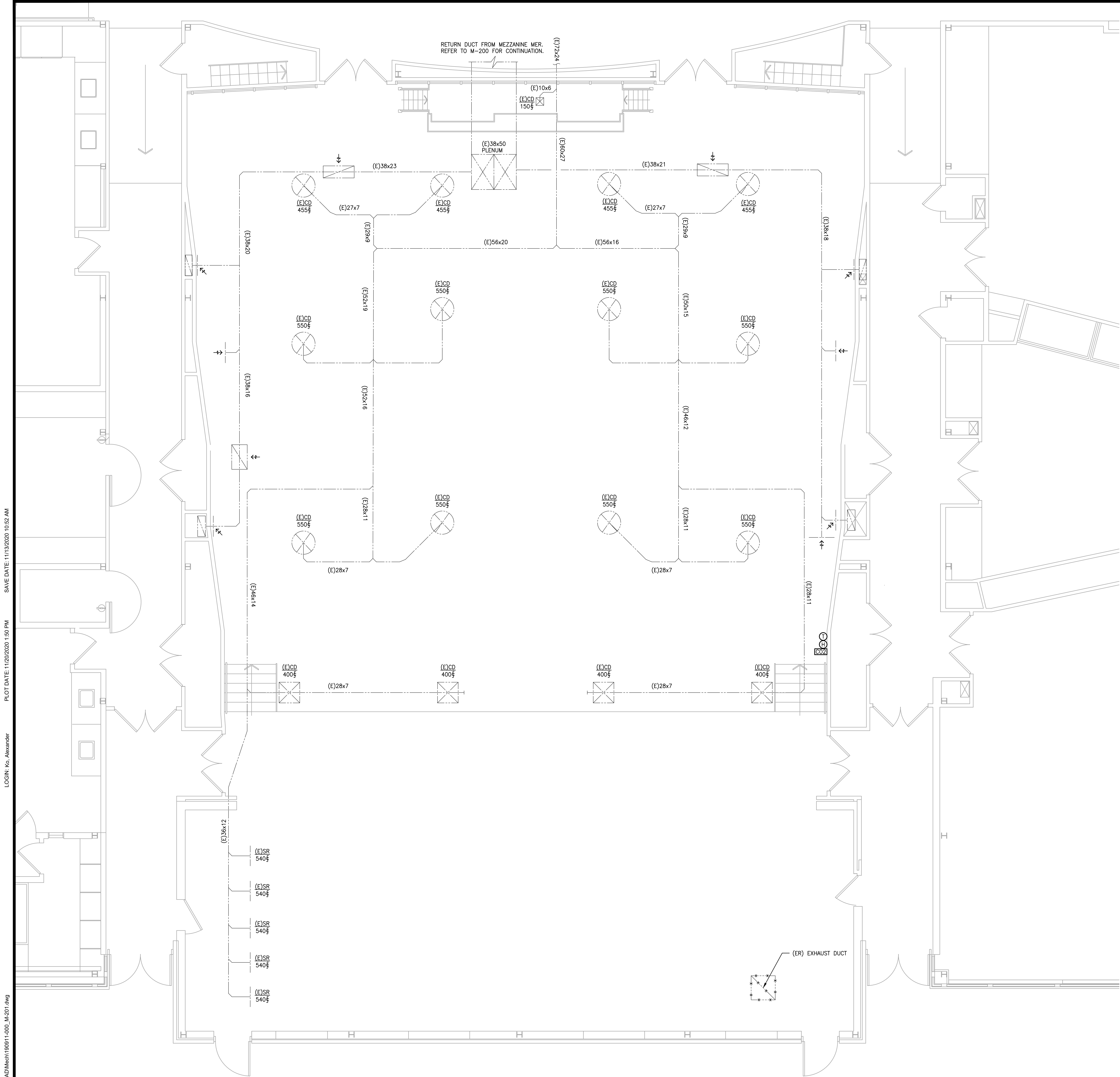
2 MEZZANINE LEVEL- PIPING

- KEY NOTES:
- 1 BLANK-OFF UNUSED AREA OF LOUVER. INSULATE WITH 1" RIGID FIBERGLASS BOARD.
 - 2 ELBOW SILENCER; VIBROACOUSTICS RED-HV-F1 OR SIMILAR. REFER TO SILENCER SCHEDULE ON SHEET M-300.
 - 3 REFER TO STEAM COIL CONNECTION DETAIL ON SHEET M-300.

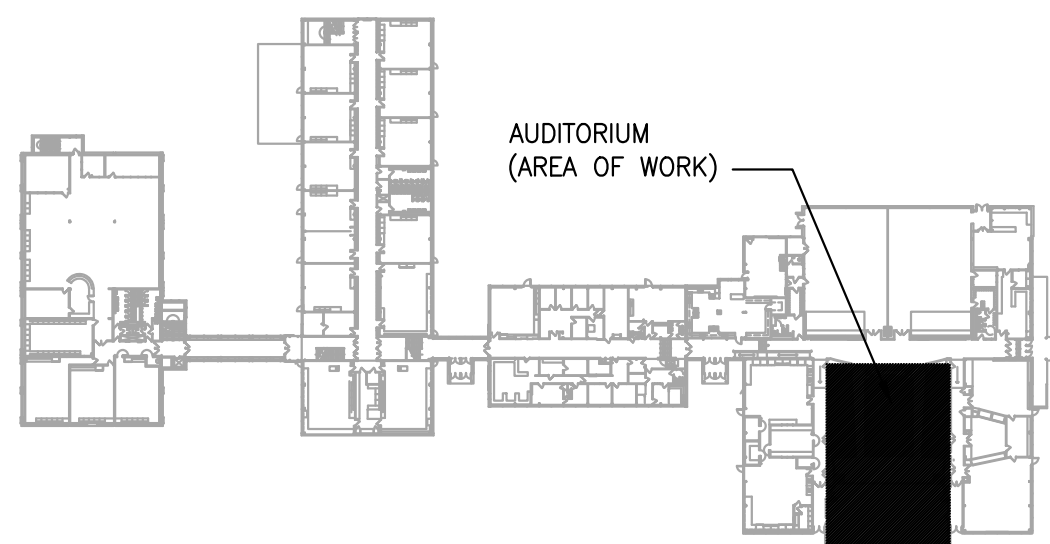


FIRST FLOOR PLAN
SCALE: NTS

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MECHANICAL FLOOR PLAN - HVAC		
Drawn By	AK	Drawing No.
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Date	11/13/2020	
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Project No.	190911-000	



- DRAWING NOTES:
- PRIOR TO THE START OF ANY WORK, CONTRACTOR SHALL TAKE PRE-CONSTRUCTION AIRFLOW READINGS AT EACH DIFFUSER AND REGISTER. READINGS SHALL INCLUDE: AIRFLOW (CFM), VELOCITY, AND STATIC PRESSURE. SUBMIT RESULTS TO ENGINEER FOR REVIEW PRIOR TO THE START OF DEMOLITION.
 - PROVIDE EXTERNAL INSULATION FOR ALL EXISTING SUPPLY AND RETURN DUCTWORK IN AUDITORIUM CEILING.



FIRST FLOOR PLAN
SCALE: NTS

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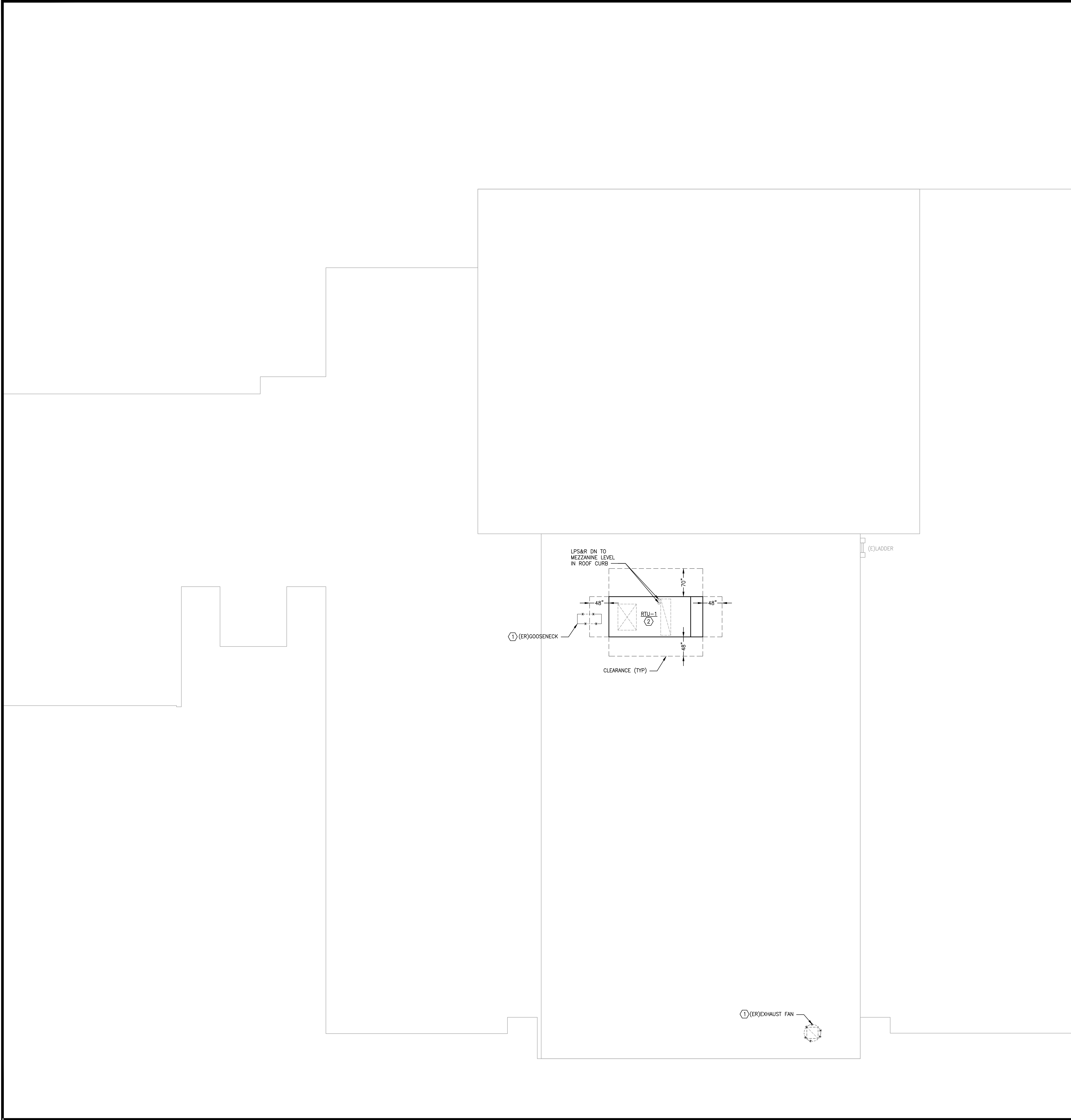
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DRAWING TITLE
MECHANICAL
PARTIAL FLOOR PLAN -
DUCTWORK

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- KEY NOTES:
- ① REMOVE CURB AND PATCH ROOF OPENING TO MAINTAIN EXISTING ROOF WARRANTY.
 - ② NEW ROOFTOP UNIT CURB MOUNTED, REFER TO STRUCTURAL DRAWINGS FOR REQUIRED ROOF REINFORCEMENT.

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MECHANICAL
PARTIAL ROOF PLAN -
HVAC

Drawn By

AK

Checked By

JM

Date

11/13/2020

Scale

1/8"=1'-0"

Project No.

190911-000

Drawing No.

M-202

PACKAGED ROOFTOP UNIT – AIR COOLED

			SUPPLY FAN DATA					RETURN/ SPILL FAN DATA					DX DATA		COOLING DATA					HEATING DATA					CONDENSING UNIT DATA										UNIT ELECTRICAL DATA				UNIT DIMENSIONS															
UNIT No.	LOCATION	SERVICE	AMBIENT TEMP (°F)					MOTOR TYPE	DRIVE TYPE					REFRIGERANT	AIR DATA							STEAM DATA					COMPRESSOR					AIR-COOLED CONDENSER					EER FULL LOAD									REMARKS								
				CFM	EXT. SP (IN. W.G.)	RPM	BHP			CFM	EXT. SP (IN. W.G.)	RPM	BHP		MOTOR HP	DRIVE TYPE	TOTAL (MBH)	SENSIBLE (MBH)	CFM	O.A. CFM	No. OF ROWS	MAX FPI	EAT °F	DB/°WB	FACE VELOCITY (FPM)	LBS/HR	PSIG	TOTAL MBH	EAT (°F)	LAT (°F)	MAX FPI	No. OF ROWS	FACE VELOCITY (FPM)	OA TEMP (°F)	STARTER TYPE	QUANTITY		No. OF STEPS	VOLTS	PHASE	HZ	FLA	CONDENSER FANS	No. OF FANS	HP		VOLTS	PHASE	HZ	MCA	LENGTH (FT-IN)	WIDTH (FT-IN)	HEIGHT (FT-IN)	OPERATING WT. (LBS)
RTU-1	ROOF	AUDITORIUM	84/74	10,673	1.5	1301	10.07	DD	VFD	11,174	1.06	864	6.13	3x2	VFD	R-410A	430.2	277.7	10,673	7371	6	12	77/65	50/50	334.8	417.1	1	391.4	54	101	8	1	393.1	0	ECM	4	—	208	3	60	200	4	0.98	13.3	208	3	60	211	16'-11"	8'-4"	8'-6"	6995	AAON RN-043	SEE NOTES

NOTES:
1. MODULATING HOT GAS REHEAT FOR HUMIDITY CONTROL.
2. VARIABLE CAPACITY COMPRESSORS, ADJUSTABLE COMPRESSOR LOCKOUTS AND COMPRESSOR SOUND BLANKETS.
3. UNIT TO INCLUDE TOTAL HEAT ENERGY RECOVERY WHEEL WITH DEFROST CYCLE.
4. POLYMER E-COATED CONDENSER COIL.
5. DOUBLE WALL CABINET CONSTRUCTION WITH FOAM FILLED INSULATION (MINIMUM R-13).
6. ENTHALPY ECONOMIZER CYCLE WITH CO2 OVERRIDE.
7. STAINLESS STEEL DRAIN PANS WITH HIGH LEVEL CONDENSATE SWITCHES.
8. FACTORY INSTALLED DDC CONTROLLER WITH BAGNET MSTP.
9. PROVIDE WITH SPACE TEMPERATURE CONTROL, HUMIDITY SENSOR, AND CARBON DIOXIDE SENSOR.
10. PROVIDE WITH DISCONNECT SWITCH.
11. 2,500 HOUR SALT SPRAY TESTED PAINT.
12. LOW SOUND CONDENSER FANS WITH HEAD PRESSURE CONTROL.
13. PROVIDE WITH ACOUSTICAL CURB.
14. PROVIDE 115V GFCI CONVENIENCE OUTLET AND CONTROL CABINET SERVICE LIGHTS.
15. INNER DISTRIBUTING TUBE TYPE STEAM COIL.

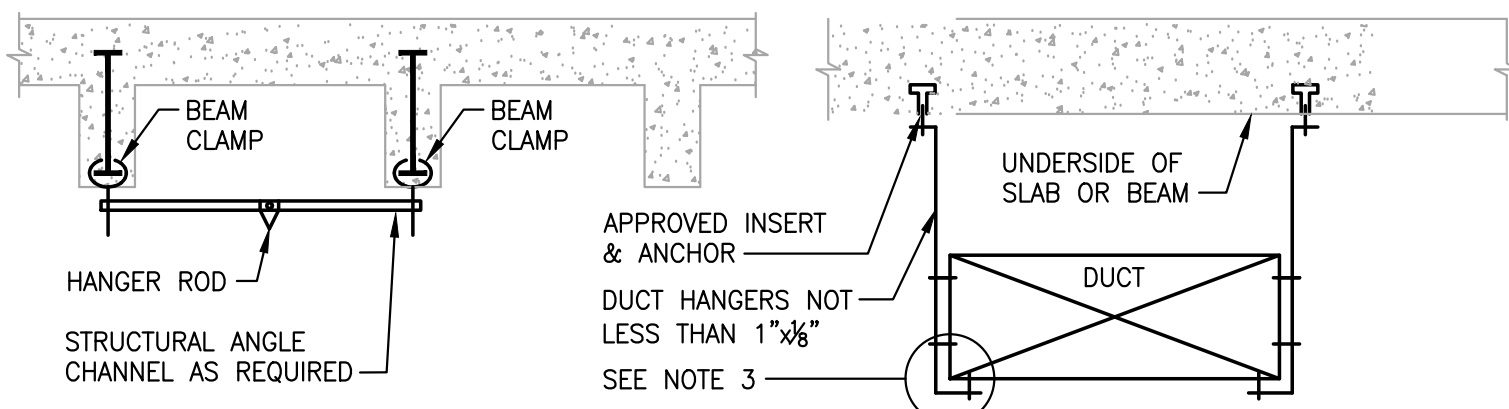
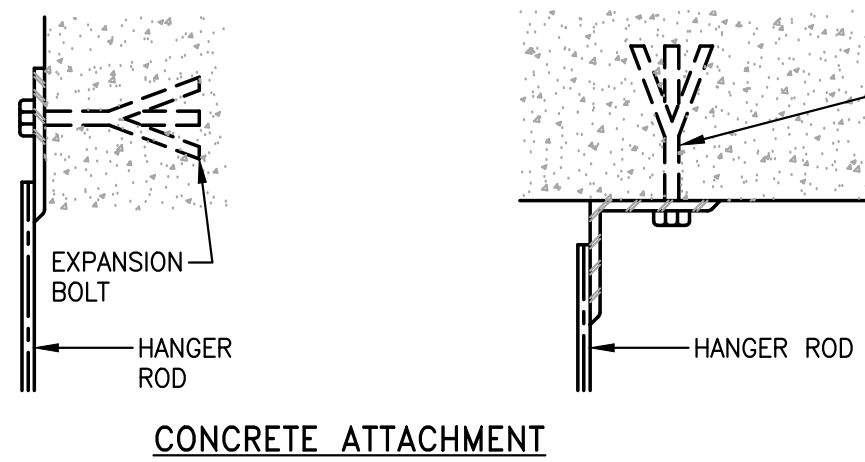
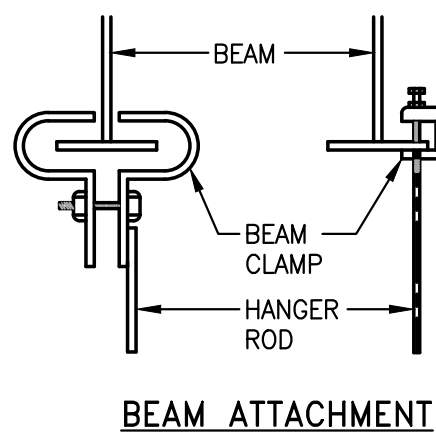
PACKAGED ROOFTOP UNIT – AIR COOLED (CONTINUED)

UNIT No.	ENERGY RECOVERY DATA																						CONDENSER FAN RADIATED SOUND POWER DATA								SUPPLY FAN SOUND POWER DATA										
	COOLING/DEHUMIDIFICATION											HEATING/HUMIDIFICATION											OCTAVE BAND (INLET+OUTLET)						OCTAVE BAND (INLET+OUTLET)												
	SENSIBLE (MBH)	LATENT (MBH)	TOTAL (MBH)	R.A. CFM	R.A. TEMPS.	O.A. CFM	O.A. TEMPS.	M.A. CFM	M.A. TEMPS.	S.A. CFM	S.A. TEMPS.	SENSIBLE (MBH)	LATENT (MBH)	TOTAL (MBH)	R.A. CFM	R.A. TEMPS.	O.A. CFM	O.A. TEMPS.	M.A. CFM	M.A. TEMPS.	S.A. CFM	S.A. TEMPS.	63	125	250	500	1K	2K	4K	8K	LwA	63	125	250	500	1K	2K	4K	8K	dBA	
RTU-1	45.96	145.52	191.48	3300	75DB/62WB	7370	75DB/62WB	10670	77.26DB/65.39WB	7370	78.27DB/66.83WB	372.69	119.96	492.65	3300	70DB/54WB	7370	0DB/-1WB	10670	53.76DB/44.81WB	7370	46.48DB/40.15WB	75	80	78	76	75	72	67	62	81	88/93	88/92	88/94	88/97	88/95	86/92	82/88	77/81	92/98	

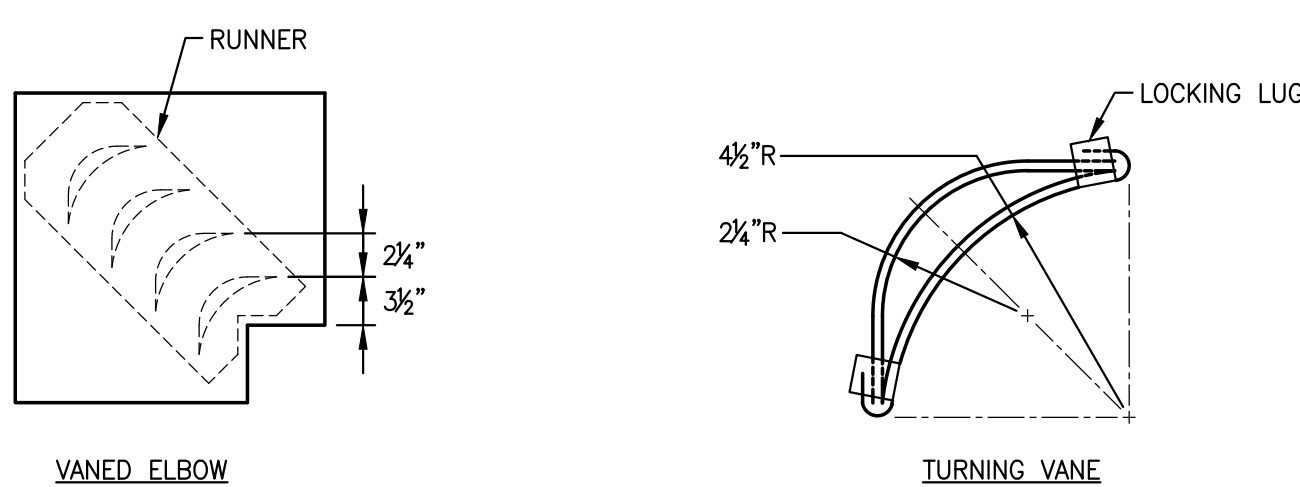
DUCT SILENCER SCHEDULE

QTY.	LOCATION	SERVICE	CFM	DUCT SIZE (IN.)	LENGTH (IN.)	FACE VELOCITY	MINIMUM REQUIRED ATTENUATION, DB								MAX. PRESSURE DROP (IN W.G.)	MANUF. MODEL #	REMARKS	
							MIN. RATED PERFORMANCE	63	125	250	500	1K	2K	4K				8K
1	MEZZANINE	RTU-1 SUPPLY	10,673	62x20	84	1239	NC-35	9	12	17	29	29	29	22	19	0.16	VIBROACOUSTICSRED-HV-F1	SEE NOTES

NOTES:
1. ELBOW SILENCER.
2. INSTALL PER MANUFACTURER'S REQUIREMENTS.



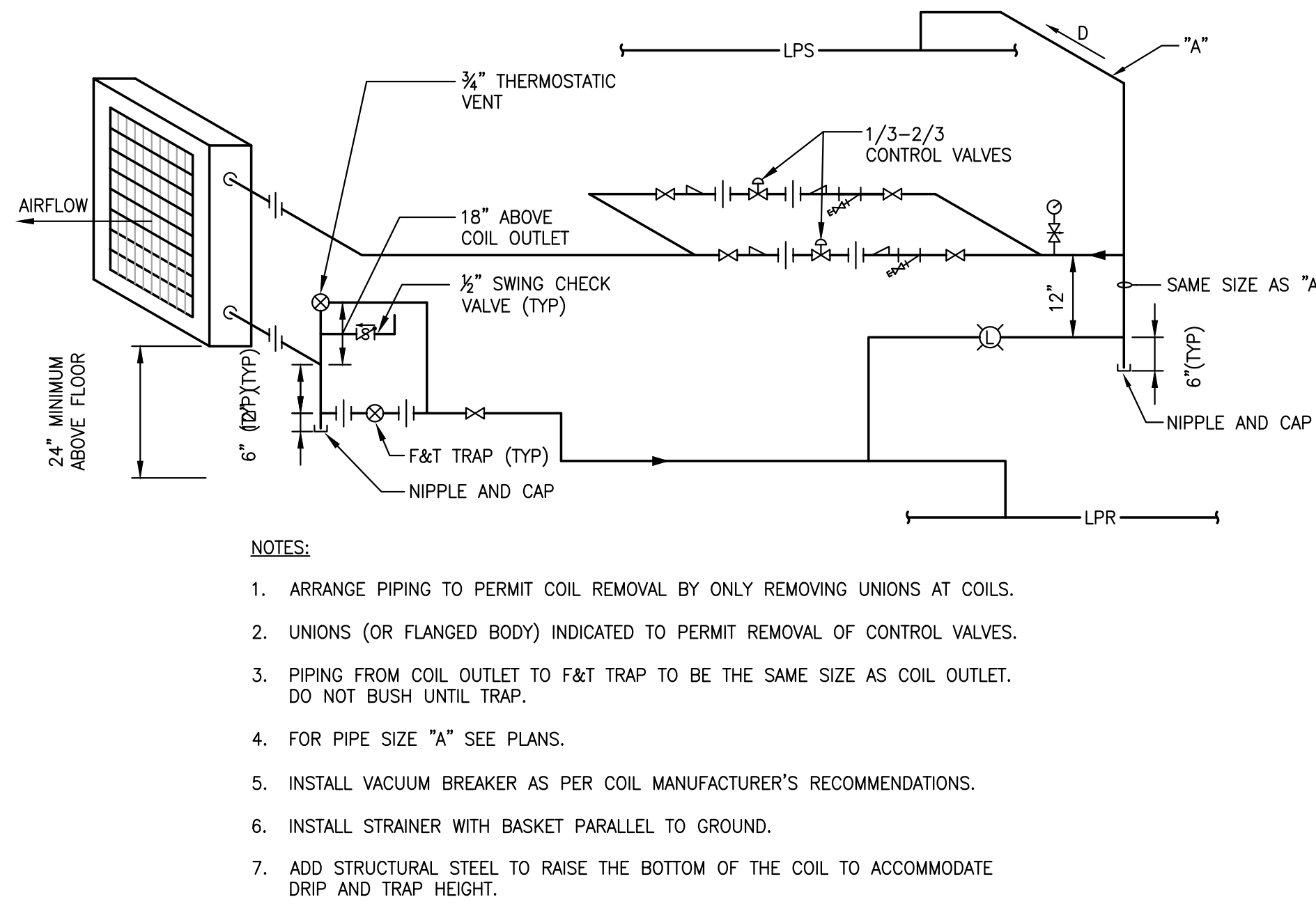
DUCT SUPPORT DETAIL



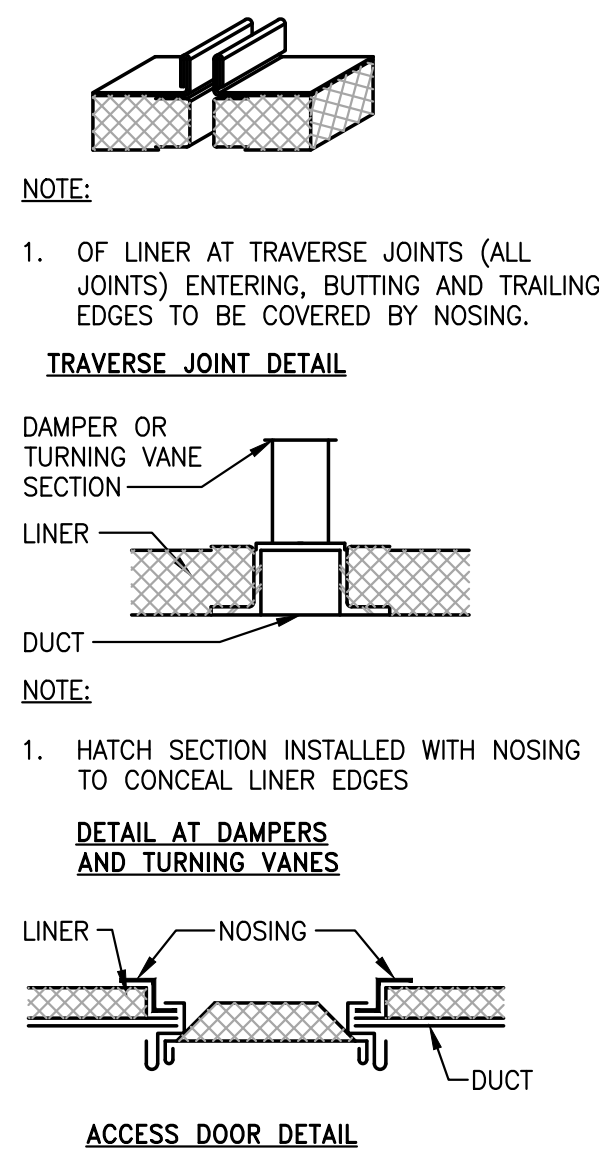
- NOTES:
- LOCKING LUGS INTERNAL WITH VANE.
 - MAXIMUM UNSUPPORTED VANE LENGTH 48".
 - RUNNER – BOLTED OR RIVETED TO ELBOW.
 - VANES SHALL BE SECURELY FASTENED TO RUNNER.
 - VANES AND RUNNER – SAME GAUGE AS ELBOW.
 - FOR DUCTS WITH EQUAL INLET AND OUTLET DIMENSIONS.

DOUBLE THICKNESS TURNING VANES FOR SQUARE ELBOWS

STEAM COIL CONNECTIONS, OPEN GRAVITY SYSTEM – ONE HIGH FOR A STEAM FLOW RATE LESS THAN 1000 LBS/HR

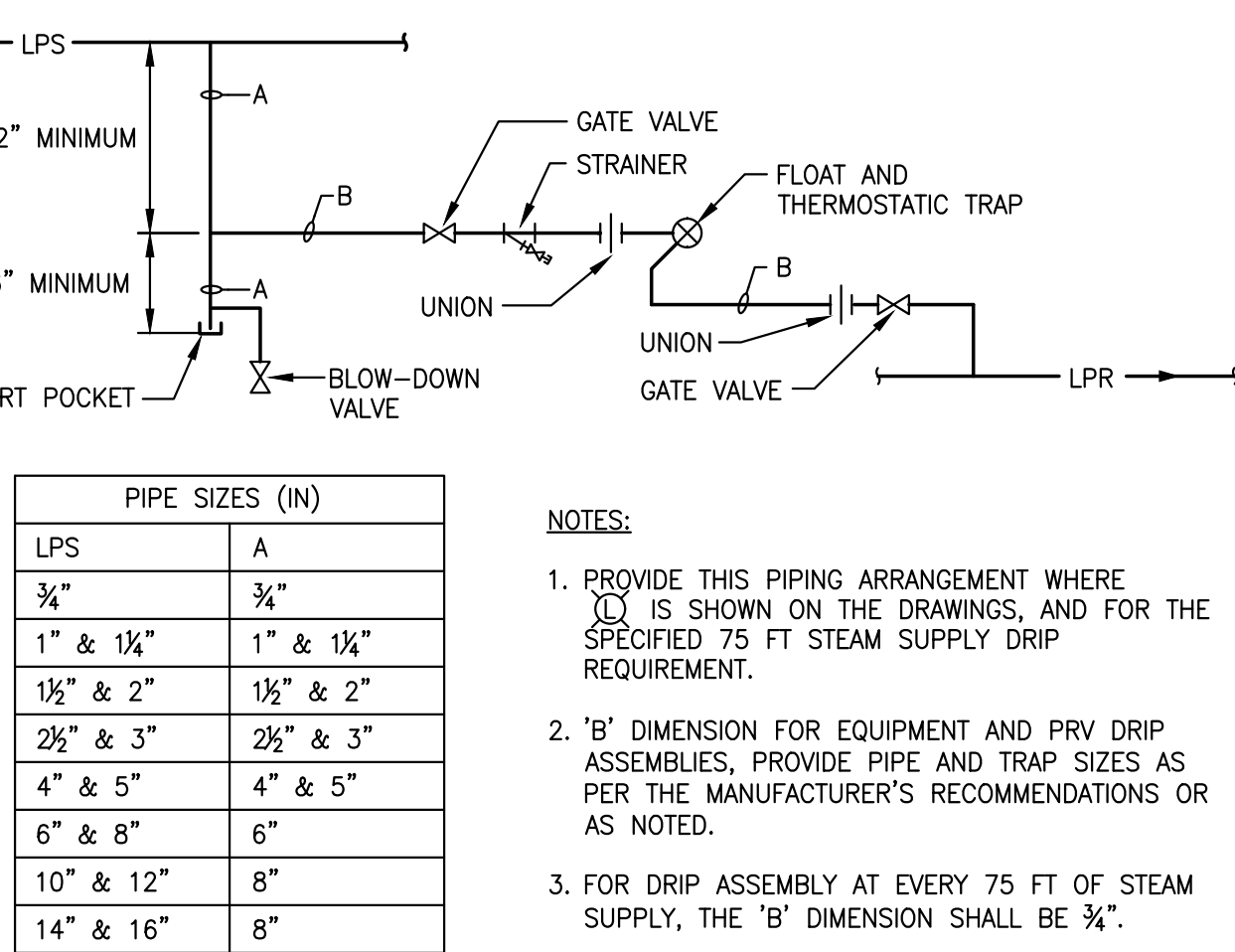
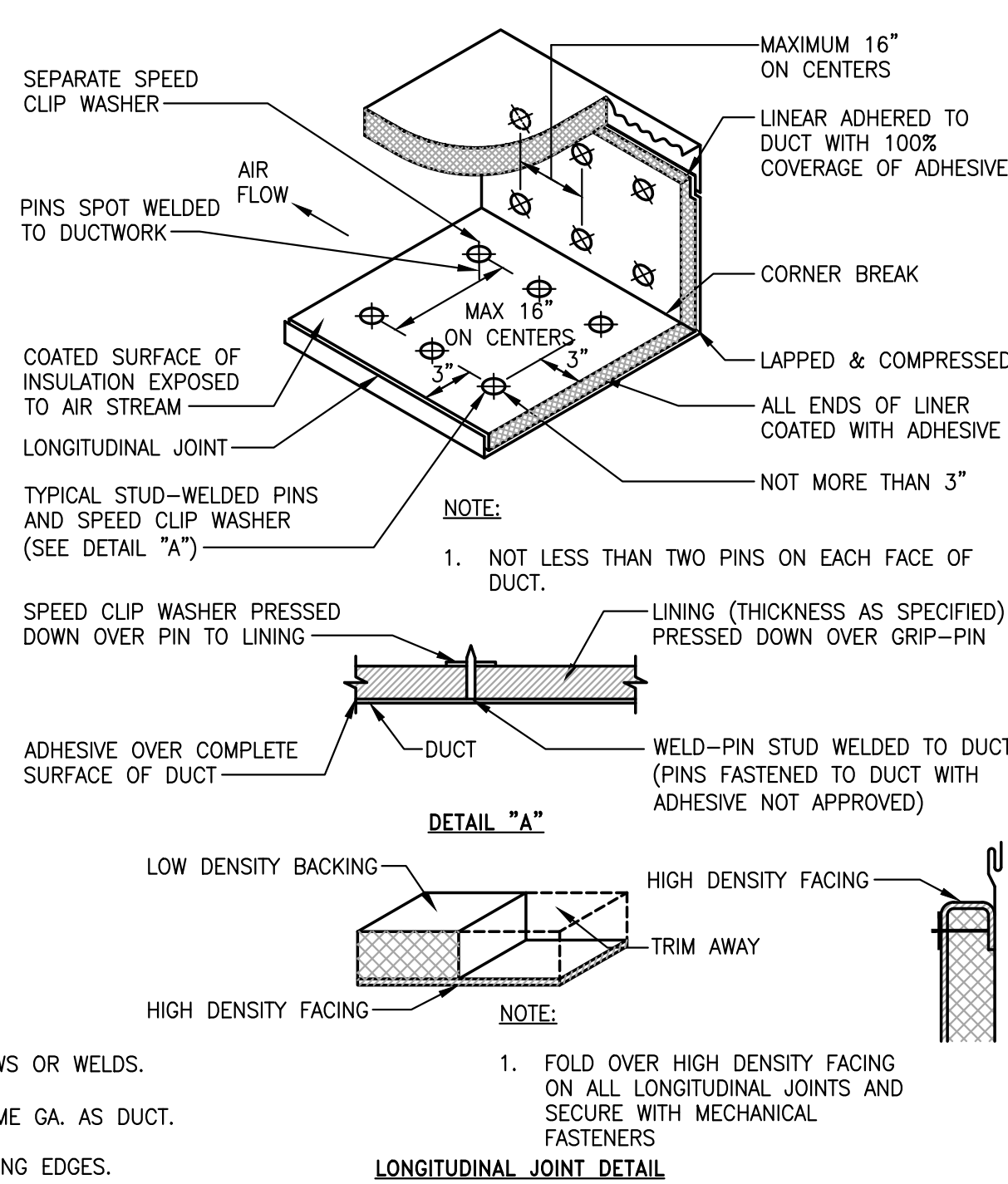


- NOTES:
- ARRANGE PIPING TO PERMIT COIL REMOVAL BY ONLY REMOVING UNIONS AT COILS.
 - UNIONS (OR FLANGED BODY) INDICATED TO PERMIT REMOVAL OF CONTROL VALVES.
 - PIPING FROM COIL OUTLET TO F&T TRAP TO BE THE SAME SIZE AS COIL OUTLET. DO NOT BUSH UNTIL TRAP.
 - FOR PIPE SIZE "A" SEE PLANS.
 - INSTALL VACUUM BREAKER AS PER COIL MANUFACTURER'S RECOMMENDATIONS.
 - INSTALL STRAINER WITH BASKET PARALLEL TO GROUND.
 - ADD STRUCTURAL STEEL TO RAISE THE BOTTOM OF THE COIL TO ACCOMMODATE DRIP AND TRAP HEIGHT.



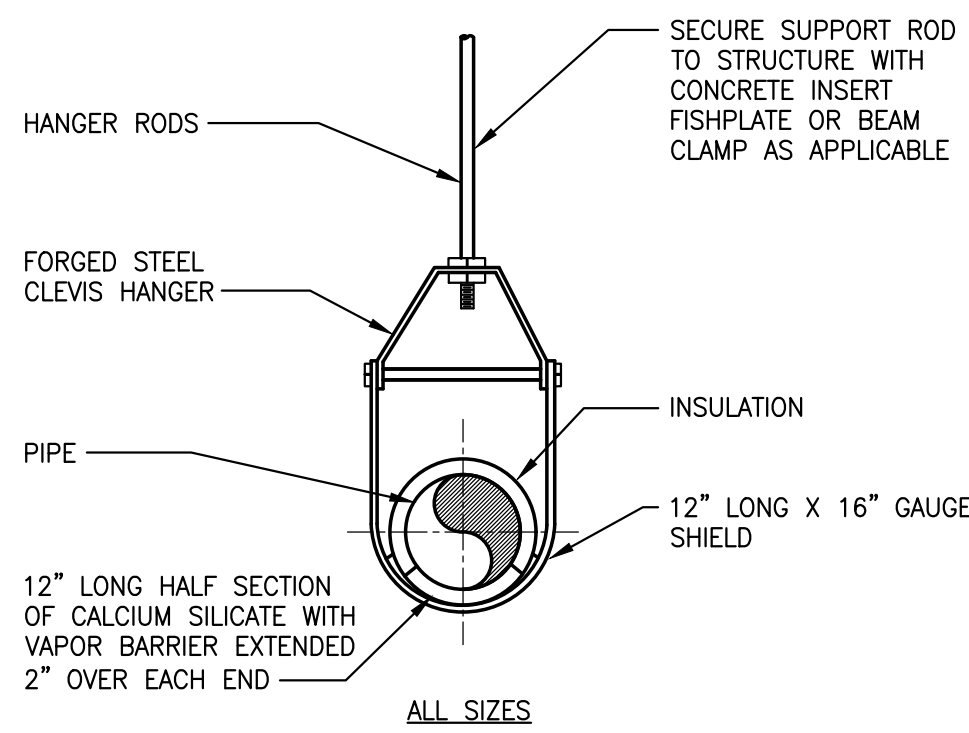
- NOTES:
- NOSING ATTACHED TO DUCT BY RIVETS, SCREWS OR WELDS.
 - NOSING: 24 GA. UP TO 48"; OVER 48" – SAME GA. AS DUCT.
 - PROVIDE SHEET METAL NOSING FOR ALL LEADING EDGES.

SOUND LINING INSTALLATION AND NOSING DETAIL

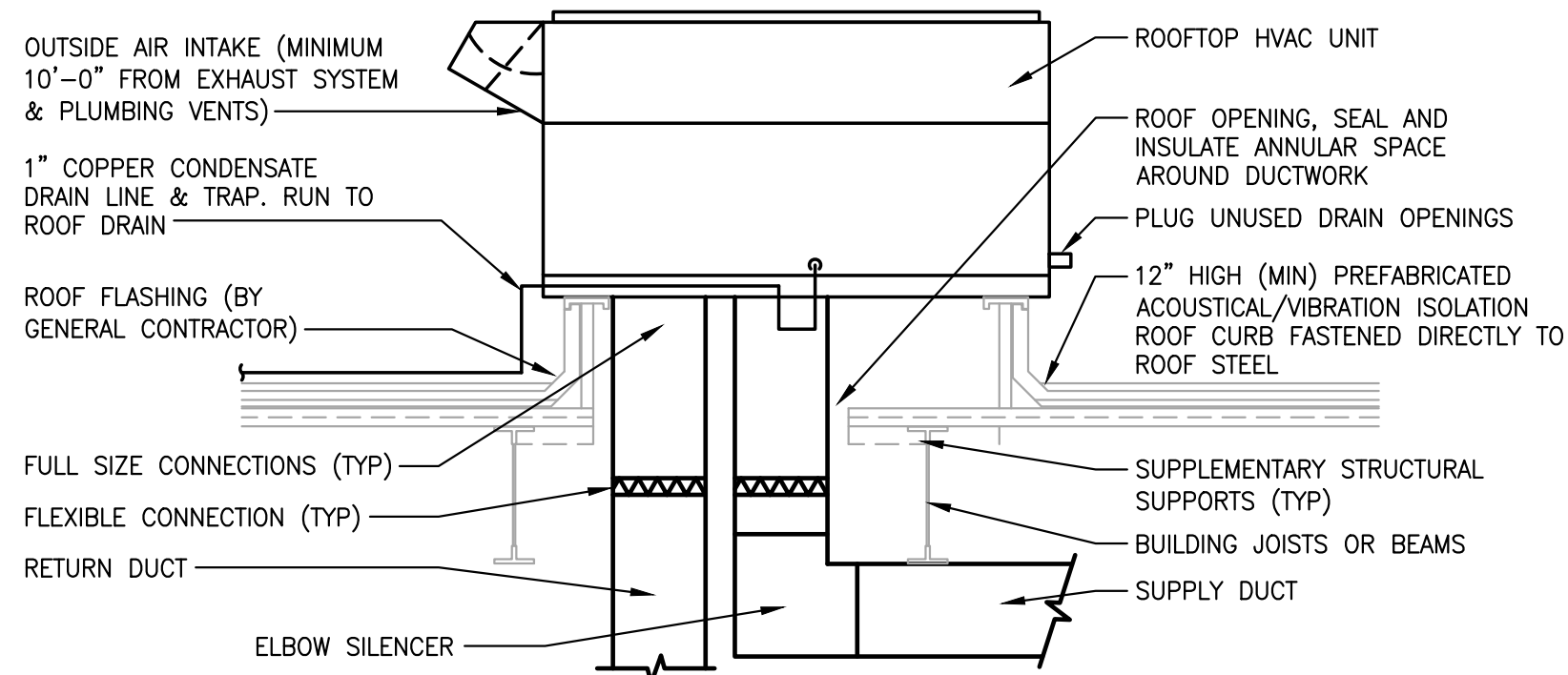


- NOTES:
- PROVIDE THIS PIPING ARRANGEMENT WHERE (C) IS SHOWN ON THE DRAWINGS, AND FOR THE SPECIFIED 75 FT STEAM SUPPLY DRIP REQUIREMENT.
 - "B" DIMENSION FOR EQUIPMENT AND PRV DRIP ASSEMBLIES, PROVIDE PIPE AND TRAP SIZES AS PER THE MANUFACTURER'S RECOMMENDATIONS OR AS NOTED.
 - FOR DRIP ASSEMBLY AT EVERY 75 FT OF STEAM SUPPLY, THE "B" DIMENSION SHALL BE 3/4".

LOW PRESSURE STEAM DRIP ASSEMBLY



PIPING HANGER DETAIL



- NOTES:
- CONTRACTOR SHALL FURNISH AND INSTALL ALL ROOF CURBS.
 - CONTRACTOR SHALL PROVIDE ALL ROOF OPENINGS. CONTRACTOR SHALL PERFORM ALL WORK REQUIRED TO PROVIDE ROOF OPENINGS.
 - CONTRACTOR SHALL FURNISH, INSTALL AND/OR PAY FOR ALL SUPPLEMENTARY STRUCTURAL SUPPORTS REQUIRED TO FURNISH AND INSTALL ROOF MOUNTED EQUIPMENT.
 - CONTRACTOR TO RUN CONDENSATE DRAIN LINE TO NEAREST ROOF DRAIN WITH PIPE SUPPORTS. PITCH PIPE FOR PROPER DRAINAGE.
 - FASTEN ROOFTOP UNIT TO ROOF CURB TO WITHSTAND WIND LOADS.
 - CONTRACTOR SHALL COORDINATE AND RETAIN THE BUILDING APPROVED ROOF CONTRACTOR TO MAINTAIN INTEGRITY OF ROOF AND WARRANTY.

ROOFTOP A.C. UNIT INSTALLATION

AKF

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Leadership in Engineering & Integrated Services

No.	Date	Description
REVISION		
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description

PROJECT
Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING TITLE
MECHANICAL
SCHEDULE AND DETAILS

Drawn By	AK	Drawing No.	M-300
Checked By	JM		
Date	11/13/2020		
Scale	NTS		
Project No.	190911-000		

HVAC SPECIFICATIONS

1. GENERAL

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AS DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- C. INVESTIGATE EACH SPACE THROUGH WITH EQUIPMENT MUST BE MOVED, WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES, ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- D. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- E. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER, WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING, INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND END CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK, CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY, WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- F. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- G. THIS CONTRACTOR SHALL SUBMIT TO THE OWNER FOR APPROVAL A PLAN INDICATING THE SIZE (MINIMUM 18 INCH X 18 INCH) AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, VALVES, DAMPERS AND CONTROLS. CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.
- H. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.
- I. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO ENSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
- J. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. REPAIR EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- K. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- L. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- M. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.
- N. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED.
- O. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE. ARCHITECT SHALL BE ADVISED IF THE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- P. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- Q. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- R. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- S. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- T. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, PARTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION, PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- U. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- V. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC.) AND CONDITIONS.
- W. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- X. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- Y. GUARANTEE:

- 1) ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME AT WHICH THE MECHANICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER, AND IS UNDER CARE, CUSTODY, AND CONTROL OF THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURERS SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP AND OPERATION OF ALL SYSTEMS INSTALLED. INSTRUCT THE OWNERS PERSONNEL IN THE PROPER OPERATION AND SERVICING OF THE SYSTEM.
- 2) THE CONTRACTOR SHALL GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL INCLUDE RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THIS CONTRACTOR.

- 3) THIS CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND OPERATION OF ALL SYSTEMS UNTIL THE FINAL ACCEPTANCE OF THE WORK.
- 4) ALL AIR CONDITIONING UNIT COMPRESSORS AND REFRIGERATION COMPONENTS SHALL HAVE A 5-YEAR WARRANTY.
- Z. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES, WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
- AA. DEFINITIONS:
- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION "THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
- 7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

2. SCOPE OF WORK

- A. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
- B. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFOR. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
- D. PERMITS AND FEES
- 1) THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFOR. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TEST OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- 2) THIS CONTRACTOR SHALL PREPARE OR HIRE THE NECESSARY CONSULTANTS TO PREPARE AND FILE ALL PLANS, CALCULATION, FORMS, ETC. REQUIRED FOR FILING WITH ALL AGENCIES REQUIRED FOR THIS WORK INCLUDING BUT NOT LIMITED TO THE DEP (DEPARTMENT OF ENVIRONMENTAL PROTECTION), DEC (DEPARTMENT OF ENVIRONMENTAL CONSERVATION), BUREAU OF AIR RESOURCES, EPA (ENVIRONMENTAL PROTECTION AGENCY), FDNY, ETC.
- E. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROL SYSTEMS. SUBMIT DRAWINGS WITH DETAILED SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.
- F. WITHIN 15 DAYS AFTER AWARD OF CONTRACT, SUBMIT FOR REVIEW, A LIST OF ALL MATERIAL AND EQUIPMENT MANUFACTURER'S PRODUCTS THAT ARE PROPOSED, AS WELL AS NAMES OF ALL SUBCONTRACTORS WHOM THIS TRADE PROPOSES TO UTILIZE ON THIS PROJECT.

3. SHOP DRAWINGS

- A. INDICATE ON EACH SUBMISSION: PROJECT NAME AND LOCATION, ARCHITECT AND ENGINEER, ITEM IDENTIFICATION AND APPROVAL STAMP OF PRIME CONTRACTOR, AND SUBCONTRACTOR NAMES AND PHONE NUMBERS, REFERENCE TO THE APPLICABLE DESIGN DRAWING OR SPECIFICATION ARTICLE, DATE AND SCALE.
- B. THE WORK DESCRIBED IN SHOP DRAWING SUBMISSION SHALL BE CAREFULLY CHECKED FOR ALL CLEARANCES (INCLUDING THOSE REQUIRED FOR MAINTENANCE AND SERVICING), FIELD CONDITIONS, MAINTENANCE OF ARCHITECTURAL CONDITIONS AND PROPER COORDINATION WITH ALL TRADES ON THE JOB.
- C. EACH SUBMITTED SHOP DRAWING IS TO INCLUDE A CERTIFICATION THAT ALL RELATED JOB CONDITIONS HAVE BEEN CHECKED AND VERIFIED AND THAT THERE ARE NO CONFLICTS.
- D. ALL SHOP DRAWINGS ARE TO BE SUBMITTED TO ALLOW AMPLE TIME FOR CHECKING IN ADVANCE OF FIELD REQUIREMENTS. ALL SUBMITTALS TO BE COMPLETE AND CONTAIN ALL REQUIRED AND DETAILED INFORMATION. SHOP DRAWINGS WITH MULTIPLE PARTS SHALL BE SUBMITTED AS A PACKAGE.
- E. IF SUBMITTALS DIFFER FROM THE CONTRACT DOCUMENT REQUIREMENTS, MAKE SPECIFIC MENTION OF SUCH DIFFERENCES IN A LETTER OF TRANSMITTAL, WITH REQUEST FOR SUBSTITUTION, TOGETHER WITH REASONS FOR SAME.
- F. ELECTRONIC COPIES OF AKF DRAWINGS:

- 1) IF THE CONTRACTOR REQUIRES (DWG) FORMAT, THE DRAWINGS WILL BE FORWARDED ONLY UPON RECEIPT OF SIGNED ACCEPTANCE OF TERMS FORM. PERMISSION FROM THE ARCHITECT MUST FIRST BE OBTAINED FOR AKF TO DEVELOP THE ELECTRICAL BACKGROUND. THEREAFTER, THE CONTRACTOR IS TO OBTAIN THE ARCHITECT'S LATEST DRAWINGS DIRECTLY FROM THE ARCHITECT.
- 2) THESE FILES ARE BEING ISSUED FOR THE CONVENIENCE OF THE CONTRACTOR AND THE CONTRACTOR REMAINS RESPONSIBLE FOR ALL CONTRACT REQUIREMENTS RELATED TO THE NORMAL SHOP DRAWING PREPARATION PROCESS.
- G. SUBMISSIONS:
- 1) PROVIDE ALL COORDINATION DRAWINGS, DUCTWORK AND PIPING SHOP DRAWINGS IN AUTOCAD FORMAT, VERSION COMPATIBLE WITH OWNER. ALL CATALOG CUTS AND SUBMITTALS TO BE COMPLETE AND CONTAIN ALL REQUIRED AND DETAILED INFORMATION. SHOP DRAWINGS WITH MULTIPLE PARTS SHALL BE SUBMITTED AS A PACKAGE.
- 2) IF PAPER SUBMISSIONS ARE TO BE PROVIDED THE FOLLOWING SHALL BE ADHERED TO.
- A. SUBMISSIONS 11 INCH X 17 INCH OR SMALLER: IF THE SUBMISSION IS A COPIED DRAWING, THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND ONE COPY. OTHERWISE, THEY SHALL SUBMIT TWO COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
- B. SUBMISSIONS LARGER THAN 11 INCH X 17 INCH: SUBMIT TWO COPIES TO THE ARCHITECT AND ONE COPY TO THE ARCHITECT WILL FORWARD TO THE ENGINEER.
- H. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
- 1) DUCTWORK LAYOUT AND SHEET METAL DESIGN.

- A. SHEETMETAL SHOP STANDARDS SHALL BE COMPILED DIRECTLY FROM THE "SMACNA DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" MANUAL, MODIFICATION FOR A SPECIFIC PROJECT, IF ANY, SHALL BE INDICATED DIRECTLY ON THE SMACNA TEMPLATES. MODIFIED SHOP STANDARDS NOT TAKEN DIRECTLY FROM THE SMACNA TEMPLATES WILL NOT BE ACCEPTED. ANY DEVIATIONS FROM SMACNA SHALL BE NOTED.
- 2) AIR OUTLETS.
- 3) AIR BALANCE REPORT.
- 4) ROOFTOP UNIT AND ROOF CURB.
- 5) DUCT SILENCERS.
- 6) PIPING AND DUCTWORK INSULATION.
- 7) PIPING AND DUCTWORK HANGERS AND SUPPORTS.
- 8) VFD DRIVES
- 9) TERMINAL BOXES (VAV, FAN POWERED, ETC.)
- 10) PIPING SHOP STANDARDS
- 11) VALVES
- 12) PIPING LAYOUT: DETAIL, AT 3/8 INCH SCALE PIPING LAYOUT WITH FITTINGS, VALVES AND EQUIPMENT. USE SINGLE LINE FOR PIPE SIZES 3 INCHES AND SMALLER, AND DOUBLE LINE FOR PIPE SIZES 4 INCHES AND GREATER. FABRICATION OF PIPE ANCHORS, HANGERS, SUPPORTS FOR MULTIPLE PIPES, ALIGNMENT GUIDES, EXPANSION JOINTS AND LOOPS, AND ATTACHMENTS OF THE SAME TO THE BUILDING STRUCTURE. SUBMIT ALL WELDING CERTIFICATES.
- 13) VIBRATION AND SEISMIC ISOLATION.
- 14) AUTOMATIC TEMPERATURE CONTROLS.

- A. DAMPER AND VALVE ACTUATORS.
- B. AUTOMATIC CONTROL SYSTEMS AND DEVICES.
- C. SEQUENCE OF OPERATIONS
- I. COORDINATION DRAWINGS: PLANS, DRAWN TO SCALE INDICATING COORDINATION BETWEEN THE TRADES USING INPUT FROM INSTALLERS OF THE ITEMS INVOLVED:
- 1) DUCT AND PIPING INSTALLATION INDICATING COORDINATION WITH GENERAL CONSTRUCTION, BUILDING COMPONENTS, AND OTHER BUILDING SERVICES. INDICATE LOCATIONS AND SIZES OF ALL OPENINGS IN FLOOR, WALLS AND ROOF THAT MAY BE REQUIRED.
- 2) COORDINATION WITH SUSPENDED CEILING COMPONENTS, STRUCTURAL MEMBERS TO WHICH DUCT WILL BE ATTACHED, SIZE AND LOCATION OF INITIAL ACCESS MODULES FOR ACOUSTICAL TILE, PENETRATIONS OF SMOKE BARRIERS AND FIRE-RATED CONSTRUCTION, LIGHTING FIXTURES, AIR OUTLETS AND INLETS, SPEAKERS, SPRINKLERS, ACCESS PANELS, PERIMETER MOLDINGS SHALL BE PERFORMED.

4. AS-BUILTS AND EQUIPMENT OPERATION INSTRUCTIONS

- A. PROVIDE ALL COORDINATION DRAWINGS, DUCTWORK AND PIPING SHOP DRAWINGS IN AUTOCAD FORMAT, VERSION COMPATIBLE WITH OWNER. ALL CATALOG CUTS AND SUBMITTALS TO BE PROVIDED IN ELECTRONIC "PDF" FORMAT THE ARCHITECT WILL FORWARD ALL SUBMISSIONS TO THE ENGINEER.
- B. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
- C. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 INCH X 11 IN FORMAT. THE CONTRACTOR SHALL GIVE ONE COPY OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
- D. THE INSTRUCTIONS SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEA WITH ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.
- E. FINAL "AS-BUILT" DRAWINGS INDICATING AS INSTALLED CONDITIONS SHALL BE PROVIDED TO THE ARCHITECT AND ENGINEER AFTER COMPLETION OF THE INSTALLATION.

5. SUBSTITUTIONS

- A. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSIONAL, PERFORMANCE AND MATERIAL SPECIFICATIONS, ANY CHANGES IN LAYOUT, ELECTRICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM THE SUBSTITUTION. ALL ITEMS SHALL BE SUBMITTED FOR REVIEW IN CONJUNCTION WITH THE SUBMITTAL OF THE SUBSTITUTION. ANY SUBSTITUTION MUST BE SUBMITTED WITH AN EXPLANATION WHY A SUBSTITUTION IS BEING UTILIZED. IF THE SUBSTITUTED ITEM DEVIATES FROM THE SPECIFIED ITEM, THOSE DEVIATIONS ARE TO BE IDENTIFIED ON A LINE BY LINE BASIS. IF THE SUBSTITUTE IS BEING UTILIZED FOR FINANCIAL REASONS, THE ASSOCIATED CREDIT MUST BE SIMULTANEOUSLY SUBMITTED.
- B. ALL SUBSTITUTED EQUIPMENT SHALL CONFORM TO SPACE REQUIREMENTS AND PERFORMANCE REQUIREMENTS SHOWN ON CONTRACT DOCUMENTS. CONTRACTOR SHALL REPLACE ANY EQUIPMENT THAT DOES NOT MEET THESE REQUIREMENTS AT HIS OWN EXPENSE. ANY ASSOCIATIONS TO ASSOCIATED SYSTEMS AND ADDITIONAL COSTS ATTRIBUTED TO THIS SUBSTITUTION SHALL BE AT THIS CONTRACTOR'S EXPENSE.
- C. CONTRACTOR SHALL SUBMIT BID BASED ON SPECIFIED ITEMS AND SHALL SUPPLY AS AN ALTERNATE PRICE ANY SUBSTITUTIONS.

6. SERVICE AND WARRANTY (MAINTENANCE CONTRACT)

- A. THIS CONTRACTOR SHALL PROVIDE AS AN ADD ALTERNATE PRICE, A FULL ONE YEAR SERVICE OF ALL MECHANICAL COMPONENTS AND SYSTEMS, WITH PRICES FOR YEARS 2, 3 AND 4 FOLLOWING THE TIME OF ACCEPTANCE OF PROJECT. THE TIME OF ACCEPTANCE OF PROJECT THE TENANT OR OWNER'S REPRESENTATIVE WILL DECIDE TO ACCEPT WHICH ALTERNATE, IF ANY. THIS IS IN ADDITION TO THE WARRANTY BEING PROVIDED AS PART OF THE BASE CONTRACT.

7. ACCESS DOORS IN GENERAL CONSTRUCTION

- A. THIS CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL A PLAN INDICATING THE SIZE (MINIMUM 18 INCH X 18 INCH) AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, VALVES, DAMPERS AND CONTROLS. CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.

8. SHEET METAL WORK

- A. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, LATEST EDITION" AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
- B. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED STEEL.
- C. DESCRIPTION OF DUCTWORK PRESSURE CLASS AND EQUIPMENT:

- 1) 2 INCH DUCT CLASS AND LESS: ALL OTHER LOW PRESSURE DUCTWORK, SEAL CLASS "C", LEAKAGE CLASS 24 (RECTANGULAR) OR CLASS 12 (ROUND).
- 2) THE FOLLOWING FITTING CONNECTIONS AND DUCT CONSTRUCTION GAUGES ARE NOT ACCEPTABLE
- A. DRIVE SLIP [T-1, T-2] FITTING CONNECTIONS
- B. 26 GAUGE DUCTWORK
- 2) TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," "TRANSVERSE (GIRTH) JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SECTION REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE." FITTING OR JOINT OF TWO DIFFERENT GAUGES, CONNECTED JOINT RATING SHALL MEET MORE STRINGENT CONDITIONS.

- 3) USE THE FOLLOWING SMACNA TRANSVERSE (GIRTH) JOINTS
- A. DUCT CONSTRUCTION AS FOLLOWS FOR 2 INCH W.G. CLASS:
- (1) UP TO 12 INCH WIDE USE T-6 OR T-7
- (2) 13 INCH TO 28 INCH WIDE USE T-11 OR T12
- (3) 29 INCH WIDE AND UP USE TDC OR TDF
- E. VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.
- 1) PROVIDE MANUAL VOLUME DAMPERS TO PROPERLY PROVIDE MANUAL BALANCING VOLUME DAMPERS AS REQUIRED TO PROPERLY BALANCE THE AIR DISTRIBUTION SYSTEM. IF THE LOCATION OF BALANCING DAMPERS IS NOT DEFINED ON THE DRAWINGS, THE FOLLOWING MINIMUM STANDARDS SHALL GOVERN:
- A. LOW PRESSURE: ALL SUPPLY AIR MAIN BRANCHES FROM TRUNK, EACH SPLIT, AND ALL SUB-BRANCHES FROM MAINS SHALL BE PROVIDED WITH BALANCING DAMPERS.
- B. LOW PRESSURE: ALL EXHAUST AND RETURN BRANCHES FROM TRUNK, EACH SPLIT AND ALL SUB-BRANCHES FROM MAINS SHALL BE PROVIDED WITH BALANCING DAMPERS.
- C. AS NOTED ON PLANS
- F. FLEXIBLE DUCTWORK SHALL NOT BE USED ON THIS PROJECT.
- G. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT.
- 1) PROVIDE MINIMUM 20 INCH X 14 INCH ON MAIN DUCTS, AND 12 INCH X 6 INCH ON BRANCH DUCTS, UNLESS OTHERWISE APPROPRIATE. PROVIDE MINIMUM 1/2 INCH DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.
- 2) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.
- H. FLEXIBLE CONNECTIONS: NEOPRENE-COATED GLASS FABRIC, 30 OZ PER SQUARE YD WITH SEWED AND CEMENTED SEAMS, SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS: ALLOW MINIMUM MOVEMENT OF 1 INCH.
- I. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE-THICKNESS VANES WITH 2 INCH INSIDE RADIUS.
- J. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.
- K. WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4 SQUARE MESH, IN 1 INCH WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.
- L. EXISTING DUCTWORK TO BE REUSED:
- 1) THIS CONTRACTOR SHALL INSPECT, SEAL PER SMACNA REQUIREMENTS, LEAK TEST, AND INSULATE ALL EXISTING DUCTWORK TO BE REUSED. EXISTING DUCTWORK TO BE REUSED SHALL CONFORM TO THE SPECIFICATIONS FOR NEW DUCTWORK LISTED HEREIN. ALL REQUIRED WORK SHALL BE PART OF BID.

9. NOISE CONTROL

- A. ALL AUDITORIUM NC LEVELS SHALL BE 20 OR LESS.
- B. PROVIDE SOUNDINGLING FOR THE FOLLOWING DUCTWORK:
- 1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 25 FEET ON EACH SIDE OF ALL FANS AND AC UNITS.
- 2) ALSO WHERE NOTED ON A DRAWING.
- C. SOUNDINGLING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, R-6 THERMAL RATING, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAME-SPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMITTE LINACUSTIC.
- D. ALL SOUNDINGLING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- E. DUCT SILENCERS
- 1) GALVANIZED, LOCKFORMED CASING CONSTRUCTED TO SMACNA STANDARDS, 2" SLIP CONNECTION AT EACH END.
- 2) AERODYNAMICALLY SHAPED, GALVANIZED NOSE AT INLET. GALVANIZED GASKET PLATES BETWEEN SPLITTERS TO ENSURE CLOSE DIMENSIONAL TOLERANCES AT AIR PASSAGES.
- 3) PERFORATED GALVANIZED SPLITTERS COMPLETE WITH PERFORATED DIFFUSER TAIL SECTIONS. SPLITTERS FILLED WITH ACOUSTIC GRADE GLASS FIBER UNDER MINIMUM 15% COMPRESSION.
- 4) REFER TO SCHEDULE ON DRAWING FOR SIZES, CONFIGURATIONS AND INSERTION LOSSES.

10. TESTING AND BALANCING

- A. ALL AIR BALANCING SHALL BE BY AN INDEPENDENT CONTRACTOR NOT AFFILIATED WITH THE MECHANICAL CONTRACTOR AND IN ACCORDANCE WITH LOCAL STANDARDS.
- B. CONTRACTOR TO BALANCE ENTIRE SYSTEM TO AIR QUANTITIES AS SHOWN ON ALL RELATED DRAWINGS FOR THIS JOB, AND AS DESCRIBED HEREIN.
- C. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF FANS AND BRANCH DAMPERS FOR MAJOR ADJUSTMENTS. AIR SUPPLY OUTLETS TO BE BALANCED TO A UNIFORM SUPPLY ACROSS ENTIRE FACE. THIS SHALL BE DONE TO PERMIT THE LEAST NOISE GENERATION AND UTILIZE MINIMUM FAN ENERGY.
- D. UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR SHALL REBALANCE ANY EXISTING PORTIONS OF AIR DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION AND ALSO BALANCE ALL NEW WORK.
- E. IF DISCREPANCIES EXIST IN THE REPORT THAT REQUIRE FIELD VERIFICATION, THE TESTING AND BALANCING COMPANY IN THE PRESENCE OF THE ENGINEER SHALL VISIT THE JOBSITE FOR FIELD VERIFICATION OF THE REPORT.
- F. THE CONTRACTOR SHALL PROVIDE ALL LABOR, PRESSURE GAUGES, FLOW METERS, SHEAVES, AND BELTS REQUIRED TO BALANCE SYSTEMS.
- G. BALANCING REPORT SHALL BE PROVIDED ON NEBB OR AABC-TYPE FORMS.
- H. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A CERTIFIED NEBB OR AABC TECHNICIAN.
- I. THE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT TO BE DEMONSTRATED BY THE CONTRACTOR.
- J. AFTER SUBMISSION OF THE FIELD VERIFIED BALANCING REPORT, THE CONTRACTOR SHALL SUBMIT A REPORT TO THE JOB SITE TO PERFORM TWO (2) OCCUPANT COMFORT BALANCES AS DIRECTED BY THE OWNER OR ENGINEER
- K. THE FINAL REPORT AFTER THE COMFORT BALANCE IS TO BE INCLUDED IN PROJECT OPERATING AND MAINTENANCE MANUAL.
- L. BALANCING AGENCY SHALL PERMANENTLY MARK ALL ADJUSTMENT DEVICES (VALVES, DAMPERS, ETC.) TO ENABLE THE SETTING TO BE RESTORED.
- M. AIR BALANCING:
- 1) PRE-CONSTRUCTION AIR TESTING: MEASURE PRESSURE, TEMPERATURE AND VOLUME OF AIR FROM EXISTING BASE BUILDING SYSTEM BEFORE STARTING WORK. TRAVERSE MAIN SUPPLY AND RETURN DUCTS BEFORE WORK TO OBTAIN SUBSTRATE REPERFORATION TO ENGINEER IMMEDIATELY AFTER COMPLETION OF TEST.
- 2) HVAC CONTRACTOR SHALL ENSURE THAT A FIRST SET OF AIR FILTERS ARE IN PLACE, WHENEVER FANS ARE RUNNING AND REPLACED WITH A NEW CLEAN SET OF FILTERS BEFORE TESTING IS COMPLETED.
- 3) TEST, ADJUST, REPLACE SHEAVES, AND BALANCE ALL EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE AIR QUANTITIES INDICATED ON PLANS WITHIN PLUS OR MINUS 5 PERCENT.
- 4) TEST REPORT SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
- A. FLOW, LEAKAGE CLASS, TEMPERATURE, STATIC PRESSURE OF AIR AT ALL TRUNK DUCTS SERVING AREAS OF WORK.
- B. TEMPERATURE OF AIR LEAVING OUTLETS AT TWO (2) TYPICAL AIR OUTLETS.

- C. QUANTITY OF AIR AT EACH AIR INLET AND OUTLET AFTER BALANCING.
- D. PROVIDE FOR ALL FANS, FAN MOTOR HP, AMPS, VOLTS, FAN RPM, CFM, INLET AND DISCHARGE STATIC PRESSURE, SHEAVE POSITION.
- E. PROVIDE FOR ALL AIR CONDITIONING UNITS, SUPPLY CFM, OUTSIDE AIR CFM, RETURN AIR CFM, MIXED AIR CFM. PROVIDE OUTSIDE AIR, MIXED AIR AND SUPPLY AIR TEMPERATURES (DRY BULB - COOLING AND HEATING, WET-BULB-COOLING.) INDICATE UNIT OPERATING MODE DURING TEST.
- F. LISTING OF DESIGN AND ACTUAL READINGS AS WELL AS ALL MANUFACTURER'S DATA FOR EQUIPMENT.

11. INSULATION - GENERAL REQUIREMENTS

- A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DEGRADATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.
- B. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS.
- C. DEFINITIONS:
- 1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.
- 2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.

12. DUCTWORK INSULATION

- A. INSULATE ALL DUCTWORK IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.
- INSULATION SCHEDULE - DUCTWORK
- | SERVICE | LOCATION | R-VALUE | MATERIAL | FINISH |
|---------------------------|----------|---------|-----------|--------|
| SUPPLY/RETURN CONCEALED 6 | | D-1 | VAPORSEAL | |
| SUPPLY/RETURN EXPOSED 6 | | D-2 | VAPORSEAL | |
- B. REINSULATE ALL EXISTING DUCTWORK IN MECHANICAL ROOM AND ABOVE AUDITORIUM CEILING PER THIS SPECIFICATION.
- C. NON-INSULATED DUCTWORK:
- 1) WHERE SOUNDINGLING IS OF MINIMUM R-VALUE SPECIFIED FOR INSULATION.
- D. MATERIAL:
- 1) TYPE D-1: MINIMUM 1-LB DENSITY FIBERGLASS BLANKET, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FOIL-SKIRM-KRAFT FACING SIMILAR TO MANVILLE MICROLOITE.
- 2) TYPE D-2: 3 LB. FIBERGLASS BOARD, THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION SHALL BE PROVIDED WITH A FACTORY-APPLIED ALL PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO MANVILLE TYPE 814 SPIN-GLAS AP.
- E. INSTALLATION:
- 1) FIBERGLASS BLANKET: 2 INCH LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 INCH WIDE WITH MIN. 2 ROWS OF WELD PINS 12 INCH ON CENTER. SECURE ALL SEAMS WITH TAPE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.
- 2) FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 INCH WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 INCH WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.

13. PIPING INSULATION

- A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.
- INSULATION SCHEDULE - PIPING:
- HOT 100 TO 250 DEG F (UP TO 2 INCH): 2 INCH THICK, P-1 MATERIAL, FINISH N/A.
- FITTINGS & VALVES HOT 100 TO 250 DEG F (UP TO 2 INCH): 2 INCH THICK, P-4 MATERIAL, F-1 FINISH.
- HOT 100 TO 250 DEG F (2-1/2 TO 4 INCH): 3 INCH THICK, P-1 MATERIAL, FINISH N/A.
- FITTINGS & VALVES HOT 100 TO 250 DEG F (2-1/2 TO 4 INCH): 3 INCH THICK, P-4 MATERIAL, F-1 FINISH.
- COLD CONDENSATE, EQUIPMENT DRAINS BELOW 60 DEG F (ALL): 1 INCH THICK, P-1 MATERIAL, VAPORSEAL FINISH.
- B. PIPING, VALVES AND FITTINGS TO BE INSULATED:
- 1) LOW TEMPERATURE PIPING SYSTEMS: 40 TO 100 DEG F INCLUDING:
- A. CONDENSATE DRAIN PIPING.
- 2) LOW TEMPERATURE HOT PIPING SYSTEMS: 100 TO 250 DEG F INCLUDING:
- A. LOW PRESSURE STEAM SUPPLY TO 15 PSIG.
- B. LOW PRESSURE CONDENSATE RETURN, EXCEPT STEAM TRAPS AND TRAP ASSEMBLY AND RADIATION RUNOUTS CONCEALED IN RADIATION ENCLOSURES.
- C. MATERIAL:
- 1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKIRM-KRAFT FACING, ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 AS.
- 2) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS.
- D. FINISH:
- 1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
- E. INSTALLATION:
- 1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
- 2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 INCH LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE. ALL VIBRATION PRODUCTS SHALL BE SPECIFICALLY DESIGNED FOR THEIR INTENDED USE. PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK. ETC.
- 3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER PENETRATIONS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.
- 4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

- F. REINSULATE PIPING WHICH IS EXISTING AND DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED.
14. VIBRATION ISOLATION
- A. FURNISH AND INSTALL ALL NECESSARY VIBRATION ISOLATORS, VIBRATION HANGERS, MOUNTING PADS, RAILS, ETC., TO ISOLATE VIBRATION AND SOUND FROM BEING TRANSMITTED TO THE BUILDING STRUCTURE. ALL VIBRATION PRODUCTS SHALL BE SPECIFICALLY DESIGNED FOR THEIR INTENDED USE. PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK. ETC.
- B. MANUFACTURER OF THE VIBRATION ISOLATION EQUIPMENT SHALL HAVE THE FOLLOWING RESPONSIBILITIES
- 1) SUBMIT TYPE, SIZE, DEFLECTION, LOCATION AND DETAILS INCLUDING FLOOR HEIGHT FOR EACH ISOLATOR PROPOSED OR ITEMS IN THE SPECIFICATION AND ON THE DRAWINGS.
- 2) SUBMIT DETAILS OF ALL STEEL FRAMES AND CONCRETE INERTIA BASES TO BE USED IN CONJUNCTION WITH THE ISOLATION IN THIS SPECIFICATION AND IN THE DRAWINGS.
- 3) CLEARLY OUTLINE THE PROCEDURES FOR INSTALLING AND ADJUSTING THE ISOLATORS OR HANGERS.



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Leadership in Engineering & Integrated Services

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- 4) GUARANTEE THE SPECIFIED ISOLATION SYSTEMS DEFLECTION AND THAT A MINIMUM OF 90% EFFICIENCY WILL BE OBTAINED.
- C. THE FOLLOWING ARE APPROVED MANU-FACTURERS, PROVIDED THEIR SYSTEMS STRICTLY COMPLY WITH THE DESIGN INTENT FOR PERFORMANCE, DEFLECTION AND STRUCTURAL CAPACITY OF THIS SPECIFICATION.
- 1) MASON INDUSTRIES, INC., HAUPPAUGE, NY
 - 2) VIBRATION MOUNTINGS & CONTROLS, INC., BLOOMINGDALE, NJ
 - 3) AMBER BOOTH, HOUSTON, TX
 - 4) KINETICS NOISE CONTROL, INC
- D. PROVIDE INSTALLATION INSTRUCTIONS, DRAWINGS AND FIELD SUPERVISION TO ASSURE PROPER INSTALLATION AND PERFORMANCE.
- E. PROVIDE LEVELING DEVICES AND APPROVED RESILIENT DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4 INCH ISOLATORS SHALL HAVE CAPABILITY OF SUPPORTING EQUIPMENT AND PIPING AT A FIXED ELEVATION DURING INSTALLATION AND AT A SPECIFIED HEIGHT AFTER ADJUSTMENT.
- F. ALL SPRINGS SHALL HAVE AT LEAST 50% ADDITIONAL LOAD CAPACITY ABOVE DESIGN LOAD.
- G. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT CANNOT SUPPORT POINT LOADS.
- H. PROVIDE CORROSION PROTECTION FOR EQUIPMENT MOUNTED OUTDOORS.
- 1) SPRING CORROSION RESISTANCE SHALL BE POWDER COATING OF THE SPRING WITH THE STEEL HOUSING HOT DIPPED GALVANIZED. ALL HARDWARE TO BE CADMIUM PLATED.
- I. ROOFTOP AC UNITS – SPRING ROOF CURB – TYPE RSC.
- 1) ISOLATION CURB SHALL BE CUSTOM ENGINEERED TO MATCH DIMENSIONS OF ROOFTOP UNIT AND PROVIDE CONTINUOUS PERIMETER SUPPORT OF THE RTU.
 - 2) ISOLATION CURB SPRINGS SHALL BE SELECTED AND LOCATED TO PROVIDE CONSISTANT 1.5 INCH DEFLECTION OVER ENTIRE CURB. COORDINATE LOADING SPECIFICATIONS WITH ACTUAL INSTALLED RTU.
 - 3) SPRING LOCATIONS SHALL BE ACCESSIBLE AND HEIGHT ADJUSTABLE THROUGH WEATHERTIGHT ACCESS OPENINGS IN CURB.
 - 4) CLEARLY LABEL ISOLATION CURB FOR PROPER ORIENTATION UNDER RTU.
 - 5) CURB STRUCTURE SHALL BE CONSTRUCTED OF GALVANIZED STEEL WITH WELDED CROSS BRACING FOR LATERAL STIFFNESS.
 - 6) UPPER AND LOWER CURB RAILS SHALL BE FITTED WITH A CONTINUOUS FLEXIBLE GALVANIZED STEEL CORNER FLASHING WITH EPDM CORNER SEALS TO FORM A FLEXIBLE, WEATHERTIGHT ASSEMBLY.
 - 7) UPPER RAILS SHALL BE FULLY GASKETED TO PROVIDE WATER TIGHT SEAL BETWEEN ROOFTOP UNIT AND ROOF CURB.
 - 8) ISOLATION CURB SHALL BE SEISMICALLY STABLE IN OPERATION.
- J. SUPPORT OF PIPING IN EQUIPMENT ROOMS
- 1) ALL WATER PIPING OUTSIDE OF SHAFTS WITHIN 50 FEET OF CONNECTED ROTATING EQUIPMENT TO BE SUPPLIED WITH ISOLATORS.
 - 2) HANGER ROD ISOLATORS (TYPE 30N) MOUNTINGS.
 - 3) INDOOR SUPPORTED PIPING ISOLATORS (TYPE SLR).
 - 4) VERTICAL RISER PIPING ANCHOR AND GUIDES (TYPE ADA).
- K. PROVIDE FLEXIBLE CONNECTIONS BETWEEN ALL FANS AND DUCTWORK (REFER TO DUCTWORK SECTION FOR SPECIFICATIONS).
15. PIPING – GENERAL REQUIREMENTS
- A. COMPLETE WITH: PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES.
- B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:
- 1) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
 - 2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
 - 3) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
 - 4) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS)
- C. GASKETS: ONE PIECE RING TYPE 1/16 INCH MINIMUM THICKNESS KLINGER C4400 ONLY (OR APPROVED EQUAL, SUBMIT FOR APPROVAL BEFORE USE).
- D. WELDING
- 1) ALL WELDING SHALL BE DONE IN ACCORDANCE WITH ALL CODES APPLICABLE TO THE PARTICULAR SERVICE. WELDING FILLER METALS: COMPLY WITH AWS D10.12/D10.12M FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE BEING WELDED.
 - 2) COMPLY WITH SECTION II, PART C OF THE ASME BOILER AND PRESSURE VESSEL CODE FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND FOR CHEMICAL ANALYSIS OF PIPE BEING WELDED.
 - 3) QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS". COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING".
 - 4) WELDERS SHALL BE QUALIFIED FOR ALL REQUIRED PIPE SIZES, MATERIAL, WALL THICKNESS, AND POSITION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF MECHANICAL ENGINEERING (ASME) SECTION IX, BOILER AND PRESSURE VESSEL CODE. CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND THAT CERTIFICATION IS CURRENT.
 - 5) COPIES OF THE CERTIFIED WELDER QUALIFICATION REPORTS SHALL BE MAINTAINED BY THE RESPONSIBLE WELDING AGENCY AND THE COMPANY PERFORMING THE WELDING, AND SHALL BE SUBMITTED TO THE OWNER AND/OR ENGINEER UPON REQUEST.
 - 6) ALL DEFECTIVE WELDS SHALL BE CHIPPED OUT AND REPAIRED AT NO COST TO THE OWNER, BASED ON PROCEDURE TO BE SPECIFIED AT THE TIME.
- E. COPPER TUBE BRAZING
- 1) ALL BRAZING SHALL BE DONE IN ACCORDANCE WITH ALL CODES APPLICABLE TO THE PARTICULAR SERVICE. BRAZING FILLER METALS: AWS A5.8, BCUP SERIES, COPPER-PHOSPHORUS ALLOYS FOR JOINING COPPER WITH COPPER, OR BAg-1, SILVER ALLOY FOR JOINING COPPER WITH BRONZE OR STEEL.
 - 2) QUALIFY PROCESS AND OPERATORS IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION IX, "WELDING AND BRAZING QUALIFICATIONS".
 - 3) BRAZERS SHALL BE QUALIFIED FOR ALL REQUIRED TUBE SIZES, MATERIAL, WALL THICKNESS, AND POSITION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF MECHANICAL ENGINEERING (ASME), SECTION IX, BOILER AND PRESSURE VESSEL CODE.
 - A. COPIES OF THE CERTIFIED BRAZER QUALIFICATION REPORTS SHALL BE MAINTAINED BY THE RESPONSIBLE BRAZING AGENCY AND THE COMPANY PERFORMING THE BRAZING, AND SHALL BE SUBMITTED TO THE OWNER AND/OR ENGINEER UPON REQUEST.
 - B. ALL DEFECTIVE BRAZEMENTS SHALL BE CHIPPED OUT AND REPAIRED AT NO COST TO THE OWNER, BASED ON PROCEDURE TO BE SPECIFIED AT THE TIME.
- F. GASKETS
- 1) PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS, ASME B16.21, NONMETALLIC, FLAT, ASBESTOS-FREE, 1/8-INCH MAXIMUM THICKNESS UNLESS THICKNESS OR SPECIFIC MATERIAL IS INDICATED.
 - G. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE, REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
 - H. EXPANSION COMPENSATION:
 - 1) ALL PIPING SHALL BE INSTALLED TO COMPENSATE FOR EXPANSION TO PROTECT THE BUILDING, EQUIPMENT AND PIPING SYSTEMS. PROVIDE ALL GUIDES, BOLTED BONNET, EXPANSION LOOPS, SUPPLEMENTAL STEEL AND APPROVED TYPE EXPANSION JOINTS AS INDICATED OR REQUIRED FOR CONTROL OF EXPANSION.
 - I. SYSTEM FILLING:
 - 1) SYSTEMS OR PORTIONS OF SYSTEMS TO BE TESTED SHALL HAVE PROVISIONS FOR FILLING, VENTING (AIR REMOVAL), DRAINAGE AND TEST PRESSURE CONNECTION.
 - 2) LIQUID USED FOR TESTING SHALL BE CLEAN CITY WATER MIXED WITH CHEMICALS SPECIFIED BY THE BASE BUILDING WATER TREATMENT CONTRACTOR. THE BASE BUILDING CONTRACTOR SHALL HIRE THE SERVICES OF THE BUILDING WATER TREATMENT CONTRACTOR AND PROVIDE ALL REQUIRED LABOR. PROVIDE TEMPORARY METERING AND MIXING DEVICES AS REQUIRED. THE HVAC CONTRACTOR SHALL OBTAIN ALL REQUIREMENTS FROM THE BUILDING MANAGEMENT.
 - J. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
 - K. DRAIN DOWN FOR NEW PIPING CONNECTION INTO EXISTING:
 - 1) CONTRACTOR TO OBTAIN SCHEDULE AND COORDINATE WITH BUILDING MANAGEMENT FOR SYSTEM DRAIN DOWN AND CONNECTION INTO EXISTING BUILDING PIPING. ALL COSTS ASSOCIATED WITH DRAIN DOWN ARE TO BE INCLUDED AS PART OF BID.
 - L. ALL INSTRUMENTATION (PRESSURE GAUGES AND THERMOMETERS) SHALL BE RATED FOR THE SAME PRESSURE AND TEMPERATURE AS PIPING SYSTEM AND RATED SPECIFICALLY FOR THE SAME SERVICE AS THE PIPING. PRESSURE GAUGES ARE TO BE LIQUID FILLED WITH 1% ACCURACY. SELECT GAUGES AND THERMOMETERS SO THAT THE MID-POINT IS AT THE WORKING PRESSURE, AND TEMPERATURE. INSTRUMENTS TO BE MANUFACTURED BY WEISS INSTRUMENT, MILJOICO CORPORATION OR APPROVED EQUAL.
 - 1) PROVIDE THERMOMETERS IN PIPING AS INDICATED ON THE DRAWINGS AND AT THE INLET AND OUTLET OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL TEMPERATURE. THERMOMETERS TO BE ORGANIC LIQUID FILLED.
 - 2) PROVIDE PRESSURE GAUGES IN PIPING AS INDICATED ON THE DRAWINGS AND AT SUCTION AND DISCHARGE OF EACH PUMP AND AT INLETS AND OUTLETS OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL PRESSURE.
 - M. PIPE SUPPORTS:
 - 1) PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
 - 2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE CLEVIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:
 - A. STEEL 1 INCH AND SMALLER: 6 FEET.
 - B. STEEL 1-1/4 INCH AND LARGER: 10 FEET.
 - C. COPPER 1 INCH AND SMALLER: 5 FEET.
 - D. COPPER 1-1/2 IN TO 2-1/2 INCH: 8 FEET.
 - E. COPPER 3 INCH: 10 FEET.
 - F. PROVIDE ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, BRANCH PIPING AND RUNOUTS OVER 5 FEET AND CONCENTRATE LOADS DUE TO VALVES, STRAINERS AND OTHER SIMILAR ITEMS.
 - 3) ROD SIZE
 - A. PIPE 2 IN AND SMALLER: 3/8 IN
 - B. PIPE 2-1/2 IN TO 3 IN: 1/2 IN
 - C. PIPE 4 TO 8 IN: 3/4 IN
 - D. PIPE 10 IN TO 12 IN: 7/8 IN
 - 4) VERTICAL PIPING:
 - A. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.
 - B. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FEET).
 - C. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.
 - D. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.
 - E. FOR MULTIPLE PIPES, COORDINATE GUIDES, BEARING PLATES AND ACCESSORY STEEL.
 - N. VALVES – GENERAL REQUIREMENTS
 - 1) VALVE PRESSURE AND TEMPERATURE RATINGS: NOT LESS THAN INDICATED AND AS REQUIRED FOR SYSTEM PRESSURES AND TEMPERATURES.
 - 2) VALVE SIZES: SAME AS UPSTREAM PIPING UNLESS OTHERWISE INDICATED.
 - 3) VALVE-END CONNECTIONS:
 - A. FLANGED: WITH FLANGES ACCORDING TO ASME B16.1 FOR IRON VALVES
 - B. FLANGED: WITH FLANGES ACCORDING TO ASME B16.5 FOR STEEL VALVES
 - C. FLANGED: WITH FLANGES ACCORDING TO ASME B16.24 FOR BRONZE VALVES
 - D. SOLDER JOINT: WITH SOCKETS ACCORDING TO ASME B16.18.
 - E. THREADED: WITH THREADS ACCORDING TO ASME B1.20.1.
 - F. VALVE BYPASS AND DRAIN CONNECTIONS: MSS SP-45.
 - 4) GENERAL-DUTY VALVE APPLICATIONS: UNLESS OTHERWISE INDICATED, USE THE FOLLOWING VALVE TYPES:
 - A. SHUTOFF SERVICE EXCEPT STEAM: BALL, BUTTERFLY OR GATE VALVES.
 - B. SHUTOFF SERVICE, STEAM: GATE VALVES.
 - C. THROTTLING SERVICE EXCEPT STEAM: BALL, BUTTERFLY, PLUG VALVES.
 - D. THROTTLING SERVICE, STEAM: GLOBE VALVES.
 - 5) INSTALL SHUTOFF DUTY VALVES AT EACH BRANCH CONNECTION TO SUPPLY MAINS, AT SUPPLY CONNECTION TO EACH PIECE OF EQUIPMENT, AND AT EACH END OF EACH PIECE OF EQUIPMENT IS CONNECTED IN THE BRANCH LINE. INSTALL THROTTLING DUTY VALVES AT EACH BRANCH CONNECTION TO RETURN MAINS, AT RETURN CONNECTIONS TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED.
16. LOW PRESSURE STEAM SYSTEM, NOT EXCEEDING 15 PSIG:
- A. LOW PRESSURE STEAM PIPE: STEEL, SCHEDULE 40 SEAMLESS, WELDED IN ACCORDANCE WITH ASTM A53 OR AL20.
 - B. LOW PRESSURE CONDENSATE RETURN PIPE: STEEL, SCHEDULE 80, SEAMLESS, IN ACCORDANCE WITH ASTM A120.
- C. FITTINGS:
- 1) 2 INCH AND SMALLER: SCREWED JOINTS, 125 LB WSP CAST IRON FITTINGS.
 - 2) 2-1/2 INCH AND LARGER: 150 LB WSP FLANGED OR BUTT-WELDED FITTINGS.
- D. VALVES:
- 1) PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS, ASME B16.21, NONMETALLIC, FLAT, ASBESTOS-FREE, 1/8-INCH MAXIMUM THICKNESS UNLESS THICKNESS OR SPECIFIC MATERIAL IS INDICATED.
 - G. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE, REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
 - H. EXPANSION COMPENSATION:
 - 1) ALL PIPING SHALL BE INSTALLED TO COMPENSATE FOR EXPANSION TO PROTECT THE BUILDING, EQUIPMENT AND PIPING SYSTEMS. PROVIDE ALL GUIDES, BOLTED BONNET, EXPANSION LOOPS, SUPPLEMENTAL STEEL AND APPROVED TYPE EXPANSION JOINTS AS INDICATED OR REQUIRED FOR CONTROL OF EXPANSION.
 - I. SYSTEM FILLING:
 - 1) SYSTEMS OR PORTIONS OF SYSTEMS TO BE TESTED SHALL HAVE PROVISIONS FOR FILLING, VENTING (AIR REMOVAL), DRAINAGE AND TEST PRESSURE CONNECTION.
 - 2) LIQUID USED FOR TESTING SHALL BE CLEAN CITY WATER MIXED WITH CHEMICALS SPECIFIED BY THE BASE BUILDING WATER TREATMENT CONTRACTOR. THE BASE BUILDING CONTRACTOR SHALL HIRE THE SERVICES OF THE BUILDING WATER TREATMENT CONTRACTOR AND PROVIDE ALL REQUIRED LABOR. PROVIDE TEMPORARY METERING AND MIXING DEVICES AS REQUIRED. THE HVAC CONTRACTOR SHALL OBTAIN ALL REQUIREMENTS FROM THE BUILDING MANAGEMENT.
 - J. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
 - K. DRAIN DOWN FOR NEW PIPING CONNECTION INTO EXISTING:
 - 1) CONTRACTOR TO OBTAIN SCHEDULE AND COORDINATE WITH BUILDING MANAGEMENT FOR SYSTEM DRAIN DOWN AND CONNECTION INTO EXISTING BUILDING PIPING. ALL COSTS ASSOCIATED WITH DRAIN DOWN ARE TO BE INCLUDED AS PART OF BID.
 - L. ALL INSTRUMENTATION (PRESSURE GAUGES AND THERMOMETERS) SHALL BE RATED FOR THE SAME PRESSURE AND TEMPERATURE AS PIPING SYSTEM AND RATED SPECIFICALLY FOR THE SAME SERVICE AS THE PIPING. PRESSURE GAUGES ARE TO BE LIQUID FILLED WITH 1% ACCURACY. SELECT GAUGES AND THERMOMETERS SO THAT THE MID-POINT IS AT THE WORKING PRESSURE, AND TEMPERATURE. INSTRUMENTS TO BE MANUFACTURED BY WEISS INSTRUMENT, MILJOICO CORPORATION OR APPROVED EQUAL.
 - 1) PROVIDE THERMOMETERS IN PIPING AS INDICATED ON THE DRAWINGS AND AT THE INLET AND OUTLET OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL TEMPERATURE. THERMOMETERS TO BE ORGANIC LIQUID FILLED.
 - 2) PROVIDE PRESSURE GAUGES IN PIPING AS INDICATED ON THE DRAWINGS AND AT SUCTION AND DISCHARGE OF EACH PUMP AND AT INLETS AND OUTLETS OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL PRESSURE.
 - M. PIPE SUPPORTS:
 - 1) PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
 - 2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE CLEVIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:
 - A. STEEL 1 INCH AND SMALLER: 6 FEET.
 - B. STEEL 1-1/4 INCH AND LARGER: 10 FEET.
 - C. COPPER 1 INCH AND SMALLER: 5 FEET.
 - D. COPPER 1-1/2 IN TO 2-1/2 INCH: 8 FEET.
 - E. COPPER 3 INCH: 10 FEET.
 - F. PROVIDE ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, BRANCH PIPING AND RUNOUTS OVER 5 FEET AND CONCENTRATE LOADS DUE TO VALVES, STRAINERS AND OTHER SIMILAR ITEMS.
 - 3) ROD SIZE
 - A. PIPE 2 IN AND SMALLER: 3/8 IN
 - B. PIPE 2-1/2 IN TO 3 IN: 1/2 IN
 - C. PIPE 4 TO 8 IN: 3/4 IN
 - D. PIPE 10 IN TO 12 IN: 7/8 IN
 - 4) VERTICAL PIPING:
 - A. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.
 - B. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FEET).
 - C. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.
 - D. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.
 - E. FOR MULTIPLE PIPES, COORDINATE GUIDES, BEARING PLATES AND ACCESSORY STEEL.
 - N. VALVES – GENERAL REQUIREMENTS
 - 1) VALVE PRESSURE AND TEMPERATURE RATINGS: NOT LESS THAN INDICATED AND AS REQUIRED FOR SYSTEM PRESSURES AND TEMPERATURES.
 - 2) VALVE SIZES: SAME AS UPSTREAM PIPING UNLESS OTHERWISE INDICATED.
 - 3) VALVE-END CONNECTIONS:
 - A. FLANGED: WITH FLANGES ACCORDING TO ASME B16.1 FOR IRON VALVES
 - B. FLANGED: WITH FLANGES ACCORDING TO ASME B16.5 FOR STEEL VALVES
 - C. FLANGED: WITH FLANGES ACCORDING TO ASME B16.24 FOR BRONZE VALVES
 - D. SOLDER JOINT: WITH SOCKETS ACCORDING TO ASME B16.18.
 - E. THREADED: WITH THREADS ACCORDING TO ASME B1.20.1.
 - F. VALVE BYPASS AND DRAIN CONNECTIONS: MSS SP-45.
 - 4) GENERAL-DUTY VALVE APPLICATIONS: UNLESS OTHERWISE INDICATED, USE THE FOLLOWING VALVE TYPES:
 - A. SHUTOFF SERVICE EXCEPT STEAM: BALL, BUTTERFLY OR GATE VALVES.
 - B. SHUTOFF SERVICE, STEAM: GATE VALVES.
 - C. THROTTLING SERVICE EXCEPT STEAM: BALL, BUTTERFLY, PLUG VALVES.
 - D. THROTTLING SERVICE, STEAM: GLOBE VALVES.
 - 5) INSTALL SHUTOFF DUTY VALVES AT EACH BRANCH CONNECTION TO SUPPLY MAINS, AT SUPPLY CONNECTION TO EACH PIECE OF EQUIPMENT, AND AT EACH END OF EACH PIECE OF EQUIPMENT IS CONNECTED IN THE BRANCH LINE. INSTALL THROTTLING DUTY VALVES AT EACH BRANCH CONNECTION TO RETURN MAINS, AT RETURN CONNECTIONS TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED.
17. LOW PRESSURE WATER SYSTEM, BELOW 100 PSIG, -20 TO 200 DEG F OPERATING TEMPERATURES.
- A. CONDENSATE DRAIN PIPING
- 1) PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE "L".
 - 2) FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.
 - 3) PITCH, EXCEPT AS NOTED:
 - A. 1 INCH IN 4 FEET PREFERRED.
 - B. 1 INCH IN 8 FEET MINIMUM.
18. ELECTRICAL WORK
- A. GENERAL:
- 1) ELECTRICAL POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING SHALL BE PROVIDED BY THE HVAC CONTRACTOR. CONTROL WIRING SHALL BE DEFINED AS ANY WIRING 120V AND BELOW INSTALLED FOR PURPOSES OTHER THAN PROVIDING PRIMARY ELECTRICAL POWER TO EQUIPMENT.
 - 2) MOTOR STARTERS AND VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FURNISHED BY THE HVAC CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO EQUIPMENT SECTION FOR VARIABLE FREQUENCY DRIVE SPECIFICATIONS.
 - 3) DUCT MOUNTED SMOKE DETECTORS, WHERE REQUIRED, SHALL BE PROVIDED BY AND WIRED BY THE ELECTRICAL CONTRACTOR, AND MOUNTED BY THE HVAC CONTRACTOR.
 - A. THIS CONTRACTOR SHALL INSTALL THE SMOKE DETECTOR SAMPLING TUBING INTO THE DUCT AS COORDINATED IN THE FIELD.
 - B. THIS CONTRACTOR SHALL ASSIST THE ELECTRICAL CONTRACTOR IN TESTING THE DUCT-MOUNTED SMOKE DETECTION SYSTEM.
 - 4) ALL ELECTRICAL CONTROL WIRING SHALL COMPLY WITH LOCAL ELECTRICAL CODE, ALL AUTHORITIES HAVING JURISDICTION AND THE PROJECT ELECTRICAL SPECIFICATIONS.
 - 5) MECHANICAL CONTRACTOR TO OBTAIN QUANTITY OF CONTROLLERS REQUIRED AND COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL WIRING, INCLUDING STARTERS, INTERLOCKS AND CONNECTIONS FOR STARTERS.
 - 6) THE MECHANICAL CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL POINT TO POINT, COMPLETELY COORDINATED WIRING DIAGRAMS AND INDICATE ALL SOURCE POWER REQUIREMENTS AND ALL FIELD WIRING TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR.
 - 7) WHERE EXISTING STARTERS ARE TO BE REUSED, THIS CONTRACTOR SHALL MAINTAIN ALL EXISTING CONTROL CONNECTIONS. WHERE NEW STARTERS ARE TO BE PROVIDED TO REPLACE EXISTING, THIS CONTRACTOR SHALL SURVEY THE EXISTING CONTROL CONNECTIONS AND PREPARE AN EXISTING CONTROL WIRING DIAGRAM PRIOR TO DEMOLITION FOR SUBMITTAL TO THE OWNER. THE NEW STARTERS SHALL BE PROVIDED WITH THE NECESSARY CONTACTS AND RELAYS REQUIRED TO RECONNECT THE EXISTING CONTROLS. PROVIDE ALL REQUIRED CONTACTS FOR START/STOP AND FIRE ALARM.
19. MOTORS:
- A. MOTORS SHALL HAVE THE ELECTRICAL CHARACTERISTICS AS LISTED ON THE DRAWINGS. COORDINATE ALL REQUIREMENTS WITH ELECTRICAL CONTRACTOR. ALL MOTORS SHALL COMPLY WITH NEMA MG-1 STANDARD AND SHALL BE OF THE HIGH EFFICIENCY TYPE AND MEET THE 1992 EPA ENERGY EFFICIENCY ACT AND UTILITY COMPANY REBATE REQUIREMENTS.
 - B. MOTORS FOR VARIABLE FREQUENCY DRIVES (VFD) SHALL BE SUITABLE FOR USE WITH VARIABLE FREQUENCY DRIVES AND COMPLY WITH NEMA MG-1 PART 31 AND 42. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS OF THE MOTOR AND VFD MANUFACTURER.
 - C. IF CONTRACTOR ELECTS TO SUBSTITUTE OR INCREASE MOTOR HORSEPOWER OVER THAT SPECIFIED, THE COST OF MOTOR AND ELECTRICAL CHANGES SHALL BE BORNE BY THIS CONTRACTOR.
 - D. MOTORS (UNDER HVAC WORK) IN ACCORDANCE WITH NEMA, IEEE AND ANSI C50 STANDARDS:
 - 1) STANDARD EFFICIENCY UNLESS OTHERWISE NOTED.
 - 2) 115 SERVICE FACTOR INCLUDING MOTORS SERVED FROM A VFD.
 - 3) SQUIRREL CAGE INDUCTION, OPEN DRIPPROOF TYPE, 1750 RPM, NEMA TYPE B INSULATION CLASS, CONTINUOUS DUTY, EXCEPT AS NOTED.
20. MOTOR CONTROLLERS
- A. SUPPLIED BY HVAC CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
 - B. ENCLOSURES:
 - 1) PROVIDE ENCLOSURES FOR STARTERS AND VFD'S SUITABLE FOR OPERATING ENVIRONMENT. ENCLOSURE'S SHALL BE NEMA 1 VENTILATED SHEETMETAL FOR INDOOR APPLICATION, NEMA 3R WITH ADDITIONAL GASKETING WEATHER-PROOF RAIN TIGHT ENCLOSURE FOR EXPOSED OUTDOOR SERVICE OR INDOOR SERVICE EXPOSED TO MOISTURE. PROVIDE DISCONNECT SWITCH ON ENCLOSURE AS REQUIRED FOR SERVICE.
 - C. WITH SOLID-STATE (ELECTRONIC) OVERLOAD PROTECTION. COORDINATE ALL MOTOR CONTROLLER TYPES AND SIZES WITH MOTOR TYPES AND SIZES.
 - D. 1/3 HP AND SMALLER: PROVIDE MANUAL STARTER EXCEPT USE MAGNETIC TYPE WHERE AUTOMATICALLY CONTROLLED.
 - 1) MANUAL TYPE: 2-POLE TOGGLE SWITCH WITH OVERLOAD PROTECTION AND PILOT LIGHT.
 - E. 1/2 HP AND LARGER: PROVIDE MAGNETIC STARTER:
 - 1) COMBINATION UNFUSED DISCONNECT SWITCH AND MAGNETIC STARTER EXCEPT AS NOTED.
 - 2) SOLID-STATE (ELECTRONIC) OVERLOAD PROTECTION IN EACH PHASE LEG WITH RESET IN ENCLOSURE.
 - 3) HOA SELECTOR SWITCH FOR AUTOMATICALLY OPERATED MOTORS. SAFETY CONTACTS COMMON TO BOTH CONTACTS.
 - 4) RED, GREEN AND AMBER PILOT LIGHTS.
 - 5) SWITCHES: HORSE-POWER-RATED, EXTERNAL PADLOCKING TYPE.
 - 6) HOLDING COILS: 10 WATT, 120 VOLT.
 - 7) CONTACTS: MAIN LINE AND MINIMUM (2) – NORMALLY OPEN, (2) – NORMALLY CLOSED 10 AMP AUXILIARIES, IN ADDITION TO CONTACTS.
 - 8) REQUIRED FOR CONTROLS SPECIFIED.
 - 9) CONTROL TRANSFORMER: FOR MOTORS OVER 120 VOLTS, TO STEP DOWN CONTROL VOLTAGE TO 120 VOLTS; OF THE REQUIRED CAPACITY WITH FUSE AND GROUND CONNECTION ON VOLTAGE SIDE.
 - 10) FUSES: SIMILAR TO BUSSMAN.
 - 11) RELAYS: TO SUPPLEMENT AUXILIARY CONTACTS IN CONTROLLER. MINIMUM 10 WATT COIL AND TWO 10 AMP CONTACTS.
 - 12) TERMINALS: SUITABLE FOR CONDUCTORS NOTED AND AS APPROVED.
 - F. DISCONNECT SWITCHES ARE PROVIDED BY THE ELECTRICAL CONTRACTOR IF NOT INTEGRAL WITH EQUIPMENT.
 - G. ACCEPTABLE MANUFACTURERS:
 - 1) EATON/CUTLER HAMMER.
 - 2) SQUARE D.
 - 3) ALLEN BRADLEY.
 - 4) ABB.
21. EQUIPMENT
- A. PROVIDE ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS.
 - B. INSTALL EQUIPMENT IN ACCORDANCE WITH APPROVED SHOP DRAWINGS, MANUFACTURERS INSTRUCTIONS AND ALL CODES AND REGULATIONS WHICH APPLY.
 - C. PROVIDE EQUIPMENT SUPPORTS AND/OR MOUNTINGS AS INDICATED ON THE DRAWING, IN VIBRATION SPECIFICATION AND AS FOLLOWS:
 - 1) ROOF MOUNTED EQUIPMENT – PROVIDE PREFABRICATED ISOLATED ROOF CURB WITH INTEGRAL VIBRATION ISOLATORS.
 - 2) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE EQUIPMENT LOAD.
 - 3) EQUIPMENT SHALL BE INSTALLED WITH VIBRATION ISOLATION, REFER TO VIBRATION ISOLATION SECTION.
 - D. RIGGING

- 1) THIS CONTRACTOR SHALL PROVIDE ALL REQUIRED RIGGING, HOISTING AND BRACING INSIDE THE EQUIPMENT AS INDICATED ON THE PLANS. THIS WORK SHALL BE PERFORMED BY AN INSURED CERTIFIED LICENSED RIGGING COMPANY THAT IS EXPERIENCED IN RIGGING EQUIPMENT OF THE TYPE INDICATED FOR THE AREAS SHOWN ON THE CONSTRUCTION DOCUMENTS. THIS CONTRACTOR SHALL PREPARE RIGGING PLANS FOR REVIEW AND APPROVAL PRIOR TO PROCEEDING WITH THE WORK.
- 2) ALL PERMITS REQUIRED FROM THE AUTHORITIES AND AGENCIES INVOLVED TO PERFORM THE RIGGING ARE THE RESPONSIBILITIES OF THIS CONTRACTOR.
- 3) ALL STRUCTURAL SUPPORTS, MODIFICATIONS OR ADDITIONS ARE TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO PROCEEDING WITH THE WORK. ALL SUPPLEMENTAL STRUCTURAL SUPPORTS, ELEVATOR CHARGES / MODIFICATIONS, BRACING AND PROTECTION REQUIRED FOR THE RIG IS THE RESPONSIBILITY OF THIS CONTRACTOR.
- 4) THE RIGGING CONTRACTOR SHALL HIRE AND PAY FOR ALL CHARGES AND SERVICES OF THE BUILDING ELEVATOR CONTRACTOR FOR THE RIGGING OF THE EQUIPMENT.

E. FANS:

- 1) GENERAL (APPLIES TO ALL FAN TYPES EXCEPT AS NOTED):
 - A. PROVIDE CENTRIFUGAL TYPE, NON-OVERLOADING DESIGN EXCEPT AS NOTED WITH MINIMUM CAPACITIES AS NOTED AND WITH CERTIFIED RATINGS BY AMCA. WHEEL SHALL BE FACTORY BALANCED STATICALLY AND DYNAMICALLY. BRAKE HORSEPOWER RATINGS SHALL NOT BE MORE THAN 5 PERCENT ABOVE WHAT IS NOTED ON DRAWINGS. DRIVES SHALL BE MATCHED. MULTIPLE V-BELT DRIVE UNLESS OTHERWISE NOTED WITH MINIMUM CAPACITY OF 1.4 TIMES RATED MOTOR HP. PULLEYS SHALL BE CAST IRON.
 - B. MOTOR PULLEY SHALL BE VARIABLE PITCH DIAMETER EXCEPT FANS WITH VARIABLE FREQUENCY DRIVES. SUPPLY AND INSTALL ONE FIXED PITCH PULLEY CHARGE AS REQUIRED PER FAN TO BALANCE SYSTEMS. COMPANION BELT DRIVES SHALL MAINTAIN BELTS PARALLEL. BELT GUARDS SHALL BE IN COMPLIANCE WITH OSHA REGULATIONS AND WITH TACHOMETER OPENING FOR FAN SPEED MEASUREMENTS. MANUFACTURER SHALL PROVIDE REPLACEMENT FIXED PITCHED SHEAVES WHERE NEEDED TO BALANCE SYSTEM.
- C. PROVIDE REMOVABLE FLANGED SCREENS AT INLETS OR OUTLETS WHERE NO CONNECTING DUCTWORK IS INDICATED.
- D. BEARINGS BALL ROLLER OR TAPER. PROVIDE PRESSURE TYPE LUBRICATING FITTINGS WITH PRESSURE RELIEF FITTINGS EXTENDED TO ACCESSIBLE LOCATION. MINIMUM LIFE RATING: 50,000 HOURS PER AFEMA STANDARD B-10 OR 250,000 HOURS AVERAGE (B-50) LIFE AT MAXIMUM CATALOG RATING.

F. VARIABLE FREQUENCY DRIVES

- 1) DESCRIPTION: NEMA ICS 2, IGBT, PWM, VFC; LISTED AND LABELED AS A COMPLETE UNIT AND ARRANGED TO PROVIDE VARIABLE SPEED OF AN NEMA MG 1, DESIGN B, 3-PHASE INDUCTION MOTOR BY ADJUSTING OUTPUT VOLTAGE AND FREQUENCY.
- 2) VFD SHALL BE MANUFACTURED BY ABB MODEL ACH550 ECLIPSE BYPASS
- 3) PROVIDE UNIT SUITABLE FOR OPERATION OF PREMIUM-EFFICIENCY MOTOR INSULATION RATED 1600V UP TO 3 INDEPENDENT BANDS OF INDEPENDENT RANGE
- 4) DESIGN AND RATING: MATCH LOAD TYPE SUCH AS FANS, BLOWERS, AND PUMPS; AND TYPE OF CONNECTION USED BETWEEN MOTOR AND LOAD SUCH AS DIRECT OR THROUGH A POWER-TRANSMISSION CONNECTION
- 5) CONFIRM VFD RATED AMPERAGE WITH MOTOR AMPERAGE TO CONFIRM COMPATIBILITY.
- 6) DELIVER VFCs IN SHIPPING SPLITS OF LENGTHS THAT CAN BE MOVED PAST OBSTRUCTIONS IN DELIVERY PATH AS INDICATED
- 7) SETUP DRIVE SET POINTS TO LOCK OUT OPERATION AT FREQUENCIES THAT MAY PROVIDE MECHANICAL RESONANCE
- 8) PROVIDE VARIABLE FREQUENCY DRIVES FOR CONTROL OF FANS AND PUMPS AS SHOWN ON PLANS
- 9) THE VFD'S SHALL BE PROVIDED WITH THE FOLLOWING OPTIONS

- A. INPUT LINE CONDITIONING: INTEGRAL MINIMUM INPUT 5% IMPEDANCE LINE REACTORS PREWIRED AND INSTALLED WITHIN VFD ENCLOSURE. MANUFACTURER TO LIST VOLTAGE TO BE PROVIDED IN PROJECT SUBMITTAL.
- B. UL/NEMA 1 ENCLOSURE OR PROVIDE ENCLOSURE FOR VFD'S SUITABLE FOR OPERATING ENVIRONMENT.
- C. MANUAL/AUTOMATIC SELECTABLE BYPASS CONTACTORS
- D. DRIVE INPUT SERVICE SWITCH AND FAST ACTING SEMI-CONDUCTOR FUSES SPECIFIC TO DRIVE.
- E. CIRCUIT BREAKER DISCONNECT WITH DOOR INTERLOCKED SWITCH.
- F. UL RATED AND LABELED 100C IAC RATED DRIVE AND BYPASS ASSEMBLY
- G. DRIVE SERVICE SWITCH
- H. CLASS 10/20/30 ADJUSTABLE OVERLOAD RELAY.
- I. PROVIDE BMS BACNET GATEWAY INTERFACE WHICH SHALL ALLOW ALL PARAMETER SETTINGS OF VFD TO BE PROGRAMMED VIA BMS CONTROL. PROVIDE CAPABILITY FOR VFD TO RETAIN THESE SETTINGS WITHIN THE NONVOLATILE MEMORY. THE VFD AND BYPASS MUST COMMUNICATE OVER THE BMS BACNET GATEWAY FOR SEAMLESS COMMUNICATIONS IN THE EVENT OF VFD FAILURE OR LOSS OF BMS COMMUNICATIONS. PROVIDE BMS MONITORING OF UP TO 45 POINTS SHALL BE AVAILABLE OVER THE BACNET COMMUNICATION NETWORK. BACNET SERIAL COMMUNICATION BYPASS CAPABILITIES SHALL INCLUDE, BUT NOT BE LIMITED TO: BYPASS RUN-STOP CONTROL; THE ABILITY TO FORCE THE UNIT TO BYPASS; AND THE ABILITY TO LOCK AND UNLOCK THE KEYPAD. THE BYPASS SHALL HAVE THE CAPABILITY OF ALLOWING THE DDC TO MONITOR FEEDBACK SUCH AS, BYPASS CURRENT (IN AMPS), BYPASS KILOWATT HOURS (RESETTABLE), BYPASS OPERATING HOURS (RESETTABLE), AND BYPASS LOGIC BOARD TEMPERATURE. THE DDC SHALL ALSO BE CAPABLE OF MONITORING THE BYPASS RELAYS OUTPUT STATUS, AND ALL DIGITAL INPUT STATUS. ALL BYPASS DIAGNOSTIC WARNING AND FAULT INFORMATION SHALL BE TRANSMITTED OVER THE SERIAL COMMUNICATIONS BUS. REMOTE BYPASS FAULT RESET SHALL BE POSSIBLE.

- J. THE BYPASS CONTROL SHALL MONITOR THE STATUS OF THE VFD AND BYPASS CONTACTORS AND INDICATE WHEN THERE IS A WELDED CONTACTOR CONTACT OR OPEN CONTACTOR COIL. THIS FAILED CONTACTOR OPERATION SHALL BE INDICATED ON THE BYPASS LCD DISPLAY AS WELL AS OVER THE SERIAL COMMUNICATIONS PROTOCOL.
- K. PROVIDE THREE ADJUSTABLE SET POINTS TO LOCK OUT OPERATION AT FREQUENCIES THAT MAY PROVIDE MECHANICAL RESONANCE.
- L. PROVIDE A SEPARATE TERMINAL STRIP FOR CONNECTION UNITS, FUSES, AND ALL DAMPERS, CONTACTS AND EXTERNAL START COMMAND. ALL EXTERNAL SAFETY INTERLOCKS SHALL REMAIN FULLY FUNCTIONAL WHETHER THE SYSTEM IS IN HAND, AUTO, OR BYPASS MODES. THE REMOTE START/STOP CONTACT SHALL OPERATE IN AUTO AND BYPASS MODES THE TERMINAL STRIP SHALL ALLOW FOR INDEPENDENT CONNECTION OF UP TO FOUR (4) UNIQUE SAFETY INPUTS.

- 10) EMV/RFI FILTERS, ALL VFDs SHALL INCLUDE EMV/RFI FILTERS. THE VFD SHALL COMPLY WITH STANDARD EN 61800-3 FOR THE FIRST ENVIRONMENT, RESTRICTED LEVEL WITH UP TO 100 FEET OF MOTOR CABLES. NO EXCEPTIONS. CERTIFIED TEST LAB TEST REPORTS SHALL BE PROVIDED WITH THE SUBMITTALS.
- 11) THE MANUFACTURER SHALL PROVIDE
 - A. FACTORY STARTUP SERVICE, INCLUDING COMPONENT TESTING, FIELD CHECK OF CONTROL CONNECTIONS, DOCUMENTATION STATING THAT ALL WORK AND DRIVE FUNCTIONS ARE OPERATING PROPERLY

No.	Date	Description

REVISION

No.	Date	Description
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW

PROJECT

ISSUE

Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING TITLE

MECHANICAL
SPECIFICATIONS

Drawn By

AK

Drawing No.

Checked By

JM

Date

11/13/2020

Scale


NTS

Project No.

190911-000

M-401

C.	PROGRAMMING OF ALL DRIVE PARAMETERS SPECIFIC TO THIS PROJECT	TWO YEAR ON SITE WARRANTY FOR PARTS AND LABOR AFTER STARTUP.	C. ENERGY RECOVERY RATINGS IN CONFORMANCE WITH ASHRAE STANDARDS 84 AND 1060.	6) "EXPPOSED". NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.	B. ALL CONTROL PANELS SHALL BE PROVIDED WITH DIN RAIL MOUNTED SCREW TERMINAL BLOCKS. FIELD WIRING SHALL BE CONNECTED TO THE SCREW TERMINAL BLOCKS. THE SCREW TERMINAL BLOCKS LOCATED/ATTACHED TO THE DDC CONTROLLER ALONE DOES NOT COMPLY WITH THIS REQUIREMENT. TERMINAL BLOCKS SHALL BE RATED FOR 300 VOLTS, MEDIUM DUTY, PROVIDE PHOENIX FEED-THROUGH TERMINAL BLOCK UT 2.5 OR PRE-APPROVED EQUAL.	C. INSERTION ELEMENTS IN DUCTS: SINGLE POINT; USE WHERE NOT EFFECTED BY TEMPERATURE STRATIFICATION OR WHERE DUCTS ARE SMALLER THAN 95% OF THE DUCT. THE LENGTH OF THE SENSOR SHALL BE A MINIMUM OF ONE-THIRD OF THE WIDTH OF THE DUCT WITH A MAXIMUM LENGTH OF EIGHTEEN (18) INCHES. THE SENSORS SHALL BE MOUNTED METAL HOUSING WITH CONDUIT ENTRANCE.
G.	ROOFTOP AIR HANDLING UNIT	1) MANUFACTURERS: AAO, DAKIN, TRANE	2) OUTDOOR AIR SECTION	C. SUBMITTALS	C. ALL CONTROL DEVICES SUCH AS RELAYS, TRANSFORMERS, TRANSDUCERS, POWER SUPPLIES, ASSOCIATED I/O DEVICES, ETC SHALL BE INSTALLED INSIDE THE PANEL, NOT AT THE STARTER OR ELECTRICAL JUNCTION BOX.	D. SPACE SENSORS (BY RTU MANUFACTURER):
2)	UNIT DESCRIPTION: PACKAGED ROOFTOP UNIT SHALL INCLUDE VARIABLE CAPACITY COMPRESSORS (0-100%), EVAPORATOR COILS, FILTERS, VARIABLE SPEED SUPPLY FANS, LOW LEAKAGE DAMPERS, AIR-COOLED CONDENSER COILS, VARIABLE SPEED CONDENSER FANS AND REHEAT PRESSURE CONTROL, HOT GAS REHEAT FOR HUMIDITY CONTROL, MODULATING GAS FIRED FURNACE WITH STAINLESS STEEL HEAT EXCHANGER, AND UNIT CONTROLS.	A. UNIT SHALL BE FACTORY ASSEMBLED AND TESTED INCLUDING LEAK TESTING OTHER THAN PRESSURE TESTING OF THE REFRIGERATION CIRCUIT, AND RUN TESTING OF THE COMPLETED UNIT. RUN TEST REPORT SHALL BE SUPPLIED WITH THE UNIT IN THE SERVICE COMPARTMENTS LITERATURE POCKET.	A. PROVIDE 100% RETURN AIR.	1) ONE (1) SUBMITTAL PACKAGE SHALL BE PROVIDED FOR THE PROJECT THAT INCLUDES INFORMATION FOR CONTROLS FOR ALL SYSTEMS BEING PROVIDED AS PART OF THE PROJECT. PARTIAL SUBMITTALS ARE NOT ACCEPTABLE AND SHALL NOT BE REVIEWED BY THE ENGINEER. FOR EXAMPLE, IT IS NOT ACCEPTABLE TO SUBMIT A CONTROL VALVE SCHEDULE AS PART OF ONE PACKAGE AND CONTROL DIAGRAMS AS PART OF A LATER PACKAGE.	D. ALL PANEL WRINGOS SHALL BE INSTALLED IN PANDUIT AND WIRING DUCT. THIS SHALL INCLUDE BUT NOT BE LIMITED TO WIRING FROM THE DDC CONTROLLER TO THE TERMINAL BLOCK, BETWEEN DDC CONTROLLER AND RELAY (AND OTHER PANEL MOUNTED CONTROL DEVICES), POWER WIRING FOR THE CONTROLLER, COMMUNICATION, ETC.	3) HUMIDITY SENSORS: BULK POLYMER SENSOR ELEMENT.
B.	LAMINATED COLOR-CODED WIRING DIAGRAM SHALL MATCH FACTORY INSTALLED WIRING AND SHALL BE AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENTS HINGED ACCESS DOOR.	C. UNIT NAMEPLATE SHALL BE PROVIDED IN TWO LOCATIONS ON THE UNIT, AFFIXED TO THE EXTERIOR OF THE UNIT AND AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENTS HINGED ACCESS DOOR.	11) FILTERS	2) PRODUCT INFORMATION: INCLUDE MANUFACTURER'S TECHNICAL LITERATURE FOR EACH CONTROL DEVICE INDICATED, LABELLED WITH SETTING OR ADJUSTABLE RANGE OF CONTROL. INDICATE DIMENSIONS, CAPACITIES, PERFORMANCE CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, FINISHES FOR MATERIALS, AND INSTALLATION AND STARTUP INSTRUCTIONS FOR EACH TYPE OF PRODUCT INDICATED.	F. UTILIZING WIRE NUTS IN THE CONTROL PANEL IS ALSO NOT ACCEPTABLE.	A. ROOM HUMIDITY SENSORS (BY BMS CONTRACTOR):
3)	CONSTRUCTION:	A. CABINET: GALVANIZED STEEL, PHOSPHATIZED, AND FINISHED WITH AN AIR-DRY PAINT COATING WITH REMOVABLE ACCESS PANELS. STRUCTURAL MEMBERS SHALL BE 16 GAUGE WITH ACCESS DOORS AND REMOVABLE PANELS OF MINIMUM 20 INCHES.	A. PROVIDE ROOF OF HEAVY GAUGE ZINC COATED STEEL WITH ALL WELDED CONSTRUCTION, AIR AND WATER PROOF GASKETING AND WOOD NAILING STRIP.	3) SUBMITTAL DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.	9) POWER WIRING AND COMMUNICATION WIRING SHALL BE PROVIDED IN SEPARATE CONDUITS WITH SEPARATE HOT, NEUTRAL, AND GROUND WIRE RUNS AND SEPARATE BREAKERS.	B. DUCT AND OUTSIDE HUMIDITY AIR SENSORS (BY HUMIDIFIER MANUFACTURER):
B.	UNITS CABINET SURFACE SHALL BE TESTED 1000 HOURS IN SALT SPRAY TEST IN COMPLIANCE WITH ASTM B117.	C. CABINET CONSTRUCTION SHALL ALLOW FOR ALL SERVICE/ MAINTENANCE FROM ONE SIDE OF THE UNIT.	B. ROOF CURB HEIGHT SHALL BE COORDINATED WITH RTU DIMENSIONS TO ACHIEVE OUTSIDE AIR INTAKE ELEVATION OF THREE FEET ABOVE ROOF.	A. SCHEMATIC FLOW DIAGRAMS SHOWING FANS, PUMPS, COILS, DAMPERS, VALVES, THERMOSTATS AND CONTROL DEVICES.	10) ALL CONTROL PANELS SHALL SATISFY UL 508A.	C. THE AIRFLOW RATE OF EACH SENSOR ASSEMBLY SHALL BE EQUALLY WEIGHTED AND AVERAGED BY THE TRANSMITTER PRIOR TO OUTPUT.
C.	CABINET TOP COVER SHALL BE ONE PIECE CONSTRUCTION OR WHERE SEAMS EXIST, IT SHALL BE DOUBLE-HEMMED AND GASKET-SEALED.	E. ACCESS PANELS: WATER- AND AIR-TIGHT PANELS WITH HANDLES SHALL PROVIDE ACCESS TO FILTERS, HEATING SECTION, RETURN AIR FAN SECTION, SUPPLY AIR FAN SECTION, EVAPORATOR COIL SECTION, AND UNIT CONTROL SECTION.	D. CURB SHALL BE MANUFACTURED IN ACCORDANCE WITH THE NATIONAL ROOFING CONTRACTORS ASSOCIATION GUIDELINES.	B. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.	11) COORDINATE INSTALLATION OF THE BMS CONTROL PANELS WITH THE ENGINEER/ARCHITECT. COORDINATE POWER FOR THE PANELS WITH THE ELECTRICAL CONTRACTOR.	D. HUMIDITY PARAMETERS SHALL INCLUDE WET BULB TEMPERATURE, DEWPOINT, FROST POINT, ENTHALPY, ABSOLUTE HUMIDITY, MIXING RATIO, VAPOR PRESSURE AND SATURATION VAPOR PRESSURE CALCULATIONS.
F.	DOWNFLOW UNIT'S BASE PANS SHALL HAVE A RAISED 1 1/8 INCH HIGH LIP AROUND THE SUPPLY AND RETURN OPENINGS FOR WATER INTEGRITY.	G. INSULATION: PROVIDE 1/2 INCH THICK COATED FIBERGLASS INSULATION ON ALL EXTERIOR PANELS IN CONTACT WITH THE RETURN AND CONDITIONED AIR STREAM.	C. ROOF CURB SHALL BE COORDINATED WITH CURB-MOUNTED VIBRATION ISOLATION SUPPORT ASSEMBLY SPECIFIED IN "VIBRATION ISOLATION".	C. ARCHITECTURE DRAWING INCLUDING ALL COMMUNICATION WIRING, NETWORK DEVICES, ETC. INDICATE TYPE OF CABLEING AND NUMBER OF CONDUCTORS.	1) THE SYSTEM SHALL ALLOW THE DISTRIBUTION OF SYSTEM FUNCTIONS SUCH AS MONITORING AND CONTROL AND GRAPHIC USER INTERFACE ETC. ACROSS THE NETWORK TO ACHIEVE MAXIMUM FLEXIBILITY AND PERFORMANCE.	E. SENSOR PROTECTION SHALL BE PLASTIC GRID WITH MEMBRANE FILTER.
G.	PROVIDE OPENINGS EITHER ON SIDE OF UNIT OR THRU THE BASE FOR POWER, CONTROL AND GAS CONNECTIONS.	I. THE BASE OF THE UNIT SHALL HAVE PROVISIONS FOR FORKLIFT AND CRANE LIFTING.	D. CURB SHALL BE MANUFACTURED IN ACCORDANCE WITH THE NATIONAL ROOFING CONTRACTORS ASSOCIATION GUIDELINES.	D. ARCHITECTURAL FLOOR PLANS INDICATING PROPOSED LOCATIONS OF ALL WALL-MOUNTED DEVICES (I.E., DDC UNITS, CONTROL PANELS, SENSORS, THERMOSTATS, ETC.) AND MECHANICAL DRAWINGS INDICATING PROPOSED LOCATIONS OF ALL TEMPERATURE, FLOW AND PRESSURE TRANSMITTERS.	2) THE DESIGN OF THE BMS SHALL NETWORK PERSONAL COMPUTER OPERATOR WORKSTATIONS, PRIMARY CONTROL PANELS AND SECONDARY CONTROL PANELS. THE NETWORK ARCHITECTURE SHALL CONSIST OF MULTIPLE NETWORK LEVELS. PROVIDE A PEER-TO-PEER PRIMARY NETWORK TO CONNECT THE PC OPERATOR WORKSTATION(S) AND ALL PRIMARY CONTROL PANELS IN THE BUILDING FOR GLOBAL SYSTEM OPERATION. PROVIDE SECONDARY NETWORKS TO CONNECT FROM EACH PRIMARY CONTROL PANEL TO THE SECONDARY CONTROL PANELS OF ASSOCIATED TERMINAL EQUIPMENT.	F. WALL MOUNTABLE WITH DISPLAY.
I.	THE BASE OF THE UNIT SHALL HAVE PROVISIONS FOR FORKLIFT AND CRANE LIFTING.	4) FANS AND MOTORS	E. ECONOMIZER PREFERRED COOLING - COMPRESSOR OPERATION IS INTEGRATED WITH ECONOMIZER CYCLE TO ALLOW MECHANICAL COOLING WHEN ECONOMIZER IS NOT ADEQUATE TO SATISFY ZONE REQUIREMENTS. COMPRESSORS ARE ENABLED IF SPACE TEMPERATURE IS RECOVERING TO COOLING SETPOINT AT A RATE OF LESS THAN 0.2 DEGREES PER MINUTE. COMPRESSOR LOW AMBIENT LOCKOUT OVERRIDES THIS FUNCTION.	F. POINTS LIST INCLUDING HARDWIRED AND SOFTWARE POINTS.	3) PRIMARY CONTROL PANELS MAY BE CONNECTED TO THE PRIMARY NETWORK VIA ROUTERS IF THIS FOLLOWS THE STANDARD ARCHITECTURE OF A SPECIFIED MANUFACTURER. PROVIDE NETWORK OR SUPERVISORY CONTROLLERS IF REQUIRED ACCORDING TO MANUFACTURER'S STANDARD ARCHITECTURE LAYOUT TO ACHIEVE NETWORK FUNCTIONALITY. QUANTITY AND LOCATIONS OF ROUTERS, NETWORK CONTROLLERS, AND SUPERVISORY CONTROLLERS TO BE COORDINATED WITH ENGINEER.	G. HUMIDITY SENSOR: 0-100 % RH, ACCURACY: ± 1.5 TO 2.0 % RH FOR TEMPERATURE RANGE FROM +32

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No.	Date	Description
REVISION		
2	11/13/20	100% CD
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ISSUE		
PROJECT		
<h1 style="margin: 0;">Greenwich Public Schools</h1> <h2 style="margin: 0;">WMS Auditorium AC Upgrade</h2> <p style="margin: 0;">1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT</p>		
DRAWING TITLE		
<h1 style="margin: 0;">MECHANICAL SPECIFICATIONS</h1>		
Drawn By _____ AK		M-403
Checked By _____ JM		
Date _____ 11/13/2020		
Scale _____ NTS		
Project No. _____ 190911-000		

- B. THE OUTDOOR AIRFLOW CFM SETPOINT SHALL BE RESET BASED ON THE SPACE AND RETURN AIR CO2 LEVEL AS SENSED BY THE SPACE AND RETURN AIR CO2 SENSORS. THE OUTDOOR AIR CFM SETPOINT SHALL BE RESET LINEARLY FROM MINIMUM CFM SETTING TO MAXIMUM CFM SETTING AS THE SPACE/RETURN AIR CO2 LEVEL RISES ABOVE OUTSIDE AIR CO2 PLUS 400PPM (ADJ.) TO 700PPM (ADJ.). RESET LIMITS SHALL BE OPERATOR ADJUSTABLE. THE OPERATOR SHALL BE CAPABLE OF ENABLING/DISABLING THE AUTOMATIC RESET AT ANY TIME FROM THE WORKSTATION.

C. THE ECONOMIZER MODE, DCV MODE (OUTDOOR AIR CFM CONTROLS) SHALL OPERATE IN PARALLEL SIMULTANEOUSLY. THE HIGHER OF THE TWO CONTROL LOOP SIGNALS SHALL CONTROL THE OUTDOOR AIR DAMPER AS REQUIRED. THE RETURN AIR DAMPERS SHALL MODULATE CLOSED PROPORTIONATELY AS THE OUTSIDE AIR DAMPER MODULATES OPEN.
- 11) ENERGY RECOVERY MODE:

A. COOLING RECOVERY MODE: WHEN THE RETURN/EXHAUST AIR ENTHALPY IS LESS THAN THE OUTSIDE AIR ENTHALPY, AND THE ENERGY RECOVERY UNIT IS IN A COOLING MODE, THE ENERGY RECOVER WHEEL SHALL BE ENABLED. THE ENERGY RECOVER WHEEL SHALL START. THE ENERGY RECOVER WHEEL SHALL MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT OF 2°F (ADJ.) LESS THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT.

B. HEATING RECOVERY MODE: WHEN THE RETURN/EXHAUST AIR ENTHALPY IS GREATER THAN THE OUTSIDE AIR ENTHALPY, AND THE ENERGY RECOVERY UNIT IS IN A HEATING MODE, THE ENERGY RECOVER WHEEL SHALL BE ENABLED. THE ENERGY RECOVER WHEEL SHALL START. THE ENERGY RECOVER WHEEL SHALL MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT OF 2°F (ADJ.) GREATER THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT.

C. PERIODIC SELF-CLEANING: THE ENERGY RECOVERY WHEEL SHALL RUN FOR 10SEC (ADJ.) EVERY 4HR (ADJ.) THAT THE ENERGY RECOVERY UNIT RUNS.

D. FROST PROTECTION: THE ENERGY RECOVERY WHEEL SHALL RUN FOR 10SEC (ADJ.) EVERY 600SEC (ADJ.) WHENEVER THE OUTSIDE AIR TEMPERATURE DROPS BELOW 15°F (ADJ.), OR WHENEVER THE EXHAUST AIR TEMPERATURE DROPS BELOW 40°F (ADJ.).
- 12) HEATING COIL LOW LIMIT CONTROL

A. THE STEAM CONTROL VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN A MINIMUM HEATING COIL DISCHARGE AIR TEMPERATURE SETPOINT OF 45°F (ADJ.) AT ALL TIME.
- 13) MIXED AIR TEMPERATURE LOW LIMIT CONTROL

A. THE OUTSIDE AIR, RETURN AIR, AND EXHAUST AIR DAMPERS SHALL BE OVERRIDDEN AS NECESSARY TO MAINTAIN THE MIXED AIR LOW LIMIT SETPOINT OF 48°F (ADJ.).
- 14) UNOCCUPIED MODE

A. THE SUPPLY AND EXHAUST FANS SHALL REMAIN OFF AND THE VARIABLE FREQUENCY DRIVES SHALL BE SET TO 0% THE RETURN AIR DAMPER SHALL OPEN AND THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE. ALL ISOLATION AND FIRE/SMOKE DAMPERS SHALL CLOSE. THE DX COILS SHALL DISABLE AND THE STEAM CONTROL VALVE SHALL MODULATE AS NECESSARY TO MAINTAIN A HEATING COIL DISCHARGE AIR TEMPERATURE OF 45°F (ADJ.).

B. IF THE RETURN AIR TEMPERATURE OR SPACE TEMPERATURE FALLS BELOW 60°F (ADJ.), THE UNIT SHALL RUN AS PER WARM-UP MODE UNTIL THE RETURN AIR TEMPERATURE OR SPACE TEMPERATURE EXCEEDS 64°F (ADJ.). THE UNIT SHALL RUN A MINIMUM OF 1/2 HOUR (ADJ.) AFTER START UP.

C. IF THE RETURN AIR TEMPERATURE OR SPACE TEMPERATURE RISES ABOVE 80°F (ADJ.), THE UNIT SHALL RUN AS PER COOL-DOWN MODE UNTIL THE RETURN AIR TEMPERATURE OR SPACE TEMPERATURE FALLS BELOW 76°F (ADJ.). THE UNIT SHALL RUN A MINIMUM OF 1/2 HOUR (ADJ.) AFTER START UP.
- 15) PROVIDE THE FOLLOWING POINTS TO THE BMS. (CONFIRM WITH RTU MANUFACTURER FOR LISTING OF AVAILABLE POINTS) :

A. FILTER DIFFERENTIAL PRESSURE (VIA DIFFERENTIAL PRESSURE TRANSMITTER).

B. SPACE TEMPERATURE.

C. SPACE HUMIDITY.

D. SPACE CARBON DIOXIDE LEVEL.

E. MIXED AIR TEMPERATURE.

F. HEATING COIL DISCHARGE AIR TEMPERATURE.

G. RETURN AIR CARBON DIOXIDE LEVEL.

H. RETURN AIR HUMIDITY.

I. RETURN AIR TEMPERATURE.

J. SUPPLY AIR HUMIDITY.

K. SUPPLY AIR STATIC PRESSURE.

L. SUPPLY AIR TEMPERATURE.

M. OUTSIDE AIR CFM.

N. OUTSIDE AIR DAMPER CONTROL (0-100%).

O. RETURN AIR DAMPER CONTROL (0-100%).

P. EXHAUST AIR DAMPER CONTROL (0-100%).

Q. HEATING CONTROL VALVE CONTROL (0-100%).

R. SUPPLY FAN VFD SPEED CONTROL (0-100%).

S. RETURN FAN VFD SPEED CONTROL (0-100%).

T. FREEZESTAT STATUS (FOR EACH).

U. SUPPLY FAN HIGH DISCHARGE PRESSURE SWITCH STATUS.

V. SUPPLY FAN LOW INTAKE PRESSURE SWITCH STATUS.

W. EXHAUST FAN LOW INTAKE PRESSURE SWITCH STATUS.

X. INDIVIDUAL SUPPLY FAN VFD STATUS (VIA CURRENT SENSING RELAY; TYPICAL FOR TWO (2) FANS).

Y. EXHAUST AIR FAN VFD STATUS (VIA CURRENT SENSING RELAY).

Z. SUPPLY FAN VFD COMMON ALARM.

AA. EXHAUST AIR FAN VFD COMMON ALARM.

BB. SUPPLY FAN VFD COMMAND (ENABLE/DISABLE).

CC. EXHAUST FAN VFD COMMAND (ENABLE/DISABLE).

DD. DX COOLING COMMAND (ONE PER STAGE; TYPICAL FOR EACH STAGE).

EE. MODULATING COOLING SIGNAL (0-100%; ONE PER STAGE).

FF. ENERGY WHEEL COMMAND (ENABLE/DISABLE).

GG. ENERGY WHEEL VFD SPEED CONTROL (0-100%; IF APPLICABLE).
- HH. CONDENSATE HIGH FLOW ALARM.
- 16) PROVIDE THE FOLLOWING POINTS ON THE ASSOCIATED EQUIPMENT GRAPHIC IN ADDITION TO THE HARDWIRED POINTS INDICATED ABOVE:

A. AHU COMMAND (ENABLE/DISABLE).

B. AHU MODE (WARM-UP, COOL-DOWN, ECONOMIZER, NORMAL, DCV, DEHUMIDIFICATION ETC.).

C. DIRTY FILTER ALARM (INDICATED IF FILTER DIFFERENTIAL PRESSURE EXCEEDS 1" (ADJ.)).

D. ECONOMIZER AVAILABLE.

E. FREEZESTAT ALARM.

F. HIGH AND LOW HEATING COIL DISCHARGE AIR TEMPERATURE ALARMS.

G. HIGH AND LOW RETURN AIR CFM ALARMS.

H. HIGH AND LOW RETURN AIR HUMIDITY ALARMS.

I. HIGH AND LOW SUPPLY AIR STATIC PRESSURE ALARMS.

J. HIGH AND LOW SUPPLY AIR TEMPERATURE ALARMS.

K. HIGH RETURN OR SPACE CARBON DIOXIDE LEVEL ALARMS.

L. HIGH AND LOW OUTSIDE AIR CFM ALARMS.

M. HIGH SUPPLY AIR HUMIDITY ALARM.

N. HIGH AND LOW SPACE TEMPERATURE ALARMS.

O. MIXED AIR LOW LIMIT SETPOINT.

P. OUTSIDE AIR CFM SETPOINT.

Q. OUTSIDE AIR MINIMUM CFM SETPOINT.

R. OUTSIDE AIR ENTHALPY.

S. OUTSIDE AIR HUMIDITY (GLOBAL POINT).

T. OUTSIDE AIR TEMPERATURE (GLOBAL POINT).

U. HEATING COIL DISCHARGE LOW LIMIT SETPOINT.

V. EXHAUST AIR CFM SETPOINT.

W. RETURN AIR ENTHALPY.

X. RETURN AIR HUMIDITY SETPOINT.

Y. RETURN OR SPACE CARBON DIOXIDE RESET PARAMETERS.

Z. SETBACK AND SETUP TEMPERATURE SETPOINTS.

AA. SUPPLY AIR STATIC PRESSURE RESET PARAMETERS.

BB. SUPPLY AIR STATIC PRESSURE SETPOINT.

CC. SUPPLY AIR TEMPERATURE RESET PARAMETERS.

DD. SUPPLY AIR TEMPERATURE SETPOINT.

EE. SUPPLY FAN FAILURE.

FF. SUPPLY FAN RUNTIME.

GG. SUPPLY FAN HIGH DISCHARGE PRESSURE ALARM.

HH. SUPPLY FAN LOW INTAKE PRESSURE ALARM.

II. EXHAUST AIR FAN FAILURE.

JJ. EXHAUST AIR FAN SPEED SETPOINT.

KK. EXHAUST FAN HIGH DISCHARGE PRESSURE ALARM.

LL. EXHAUST FAN LOW INTAKE PRESSURE ALARM.

MM. EXHAUST FAN RUNTIME.

NN. AHU RUNTIME.

OO. SYSTEM COMMAND (ON/OFF).

END OF SECTION



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2	11/13/20	100% CD
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ISSUE		
PROJECT		
Greenwich Public Schools		
WMS Auditorium AC Upgrade		
1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT		
DRAWING TITLE		
MECHANICAL SPECIFICATIONS		
Drawn By	AK	Drawing No. M-404
Checked By	JM	
Date	11/13/2020	
Scale	NTS	
Project No.	190911-000	

ELECTRICAL SYMBOLS LIST

LIGHTING

	CEILING MOUNTED EXIT LIGHT; TYPE 'X' - DIRECTIONAL ARROWS WHERE INDICATED - SHADED AREAS INDICATE ILLUMINATED FACE/FACES
	WALL MOUNTED EXIT LIGHT; TYPE 'X' - DIRECTIONAL ARROWS WHERE INDICATED - SHADED AREAS INDICATE ILLUMINATED FACE/FACES
	EMERGENCY BATTERY LIGHT UNIT 'A' = FIXTURE TYPE
	REMOTE LIGHT HEADS FOR EMERGENCY BATTERY LIGHT UNIT TYPE AS NOTED

POWER

	SINGLE POLE SWITCH 0 = CONTROLLING OUTLET 'o' 2 = DOUBLE POLE 3 = THREE-WAY 4 = FOUR-WAY D = DOOR K = KEY OPERATED MO = MOMENTARY CONTACT T = TIME SWITCH P = PILOT LIGHT
	DISCONNECT SWITCH - TOGGLE TYPE WITH THERMAL OVERLOAD - 277V HP RATED
	DISCONNECT SWITCH - TOGGLE TYPE MOTOR RATED, 20A, 1P, U.O.N.
	WALL DIMMER - TYPE 'A' NUMBER INDICATES WATTAGE RATING
	OCCUPANCY SENSOR, CEILING MOUNTED
	OCCUPANCY SENSOR, WALL MOUNTED
	PHOTO CONTROL SWITCH
	TRANSFORMER
	20A, 125V DUPLEX RECEPTACLE - FLUSH WALL MOUNTED CONTROLLED FROM WALL SWITCH 'o'
	20A, 125V QUADRUPLX RECEPTACLE - FLUSH WALL MOUNTED
	20A, 125V DUPLEX RECEPTACLE - FLUSH WALL MOUNTED, GF1 TYPE
	SINGLE RECEPTACLE - FLUSH WALL MOUNTED
	20A, 125V SURGE SUPPRESSION DUPLEX RECEPTACLE - FLUSH WALL MOUNTED
	20A, 125V DUPLEX RECEPTACLE - FLUSH FLOOR MOUNTED
	20A, 125V QUADRUPLX RECEPTACLE - FLUSH FLOOR MOUNTED
	SPECIAL PURPOSE RECEPTACLE - FLUSH WALL MOUNTED A = TYPE
	PLUG-IN SURFACE METAL RACEWAY - LETTER INDICATES TYPE - WITH SPECIAL PURPOSE RECEPTACLES WHERE INDICATED
	HOMERUN-NUMERAL WHERE USED INDICATES CIRCUIT NUMBER FOR REFERENCE ONLY. 2#12+1#12G-3/4°C FOR ONE CKT. HOMERUN, U.O.N. 4#12+1#12G-3/4°C FOR TWO CKT. HOMERUN, U.O.N. 6#12+1#12G-3/4°C FOR THREE CKT. HOMERUN, U.O.N.
	HOMERUN - NUMERAL WHERE USED INDICATES CIRCUIT NUMBER FOR REFERENCE ONLY
	MOTOR CONTROLLER
	COMBINATION MOTOR CONTROLLER AND DISCONNECT SWITCH SWITCH AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED
	UNFUSED DISCONNECT SWITCH SWITCH AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED
	FUSED DISCONNECT SWITCH; SWITCH AMPS/FUSE AMPS/ # OF POLES, VOLTAGE RATING AS REQUIRED
	ENCLOSED CIRCUIT BREAKER TRIP AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED NA = NON-AUTOMATIC
	SURFACE MOUNTED LIGHTING PANELBOARD
	FLUSH MOUNTED LIGHTING PANELBOARD
	SURFACE MOUNTED POWER PANELBOARD
	FLUSH MOUNTED POWER PANELBOARD
	SURFACE MOUNTED POWER DISTRIBUTION PANELBOARD
	CEILING MOUNTED JUNCTION BOX
	FLUSH WALL MOUNTED JUNCTION
	FLUSH FLOOR MOUNTED JUNCTION BOX
	PULLBOX
	POWER POLE
	EXISTING CONDUIT TO BE REMOVED
	EXISTING CONDUIT/EQUIPMENT TO REMAIN
	NEW CONCEALED CONDUIT
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT STUB-UP WITH FLEXIBLE EQUIPMENT CONNECTION
	FLEXIBLE EQUIPMENT CONNECTION
	CAPPED CONDUIT
	PUSH BUTTON K = KEY OPERATED H = HOLD UP P = PANIC
	SECTION A-A

SINGLE LINE DIAGRAM

	POWER TRANSFORMER VOLTAGES, WINDINGS AND SIZE AS INDICATED
	AUTOMATIC TRANSFER SWITCH ATS = AUTOMATIC TRANSFER MTS = MANUAL TRANSFER POLES AND RATINGS AS NOTED
	MOTOR
	GENERATOR
	GROUND CONNECTION
	FUSED SWITCH 100 AMP SWITCH / 90 AMP / 3 POLE
	UNFUSED SWITCH - 100 AMP SWITCH / 3 POLE
	CIRCUIT BREAKER - MOLDED CASE TYPE 90 AMP TRIP / # OF POLES LT = LONG TIME SETTING ST = SHORT TIME SETTING I = INSTANTANEOUS SETTING
	DIGITAL MULTIMETER
	CURRENT TRANSFORMER NUMBER AND RATIO AS INDICATED

SIGNAL INITIATING DEVICE & ACTIVATION SWITCH

	MANUAL STATION - PULL STATION/FIRE ALARM BOX, 'XX' DENOTES TYPE: CO2 = CARBON DIOXIDE DC = DRY CHEMICAL HL = HALON F = FIRE ALARM FO = FOAM WC = WET CHEMICAL CA = CLEAN AGENT WM = WATER MIST DL = DELUGE FIRE SPRINKLER PRE = PREACTION
	HEAT DETECTOR/SENSOR (THERMAL DETECTION) ORIENTATION NOT TO BE CHANGED
	HEAT DETECTOR/SENSOR, 'XX' DENOTES TYPE: R/F = COMBINATION RATE OF RISE/FIXED TEMPERATURE R/C = RATE COMPENSATION F = FIXED TEMPERATURE R = RATE OF RISE ONLY
	SMOKE DETECTOR/SENSOR, 'XX' DENOTES TYPE: AS = AIR SAMPLING P = PHOTOELECTRIC I = IONIZATION R = RELAY BASE SS = SINGLE STATION SB = SOUNDER BASE ID = IN DUCT
	SMOKE/HEAT DETECTOR/SENSOR COMBINATION
	SMOKE DETECTION/SENSOR FOR DUCT
	FLOW DETECTOR/SWITCH
	PRESSURE DETECTOR/SWITCH
	VALVE SUPERVISORY SWITCH
	ADDRESSABLE INPUT MODULE
	ADDRESSABLE OUTPUT MODULE
	ADDRESSABLE INPUT/OUTPUT MODULE # DENOTES NUMBER OF INPUTS AND OUTPUTS
	NON-ADDRESSABLE OUTPUT RELAY

NOTIFICATION APPLIANCES SYMBOLS

	NOTIFICATION APPLIANCE SUBSCRIBERS ('XX') WP = WEATHERPROOF WG = WIRE GUARD H = HIGH AUDIBLE SETTING L = LOW AUDIBLE SETTING C = CEILING MOUNT nW = WATTAGE SETTING (n = SPEAKER TAP) P = PENDENT SL = SIGNAL LIGHT RI = REMOTE INDICATOR
	HORN ONLY C = CEILING MOUNT
	SPEAKER ONLY C = CEILING MOUNT
	VISIBLE ONLY (STROBE) - WALL MOUNT CD = CANDELA RATING/SETTING
	VISIBLE ONLY (STROBE) - CEILING MOUNT CD = CANDELA RATING/SETTING
	COMBINATION HORN/VISIBLE CD = CANDELA RATING/SETTING C = CEILING MOUNT
	COMBINATION SPEAKER/VISIBLE CD = CANDELA RATING/SETTING C = CEILING MOUNT
	REMOTE INDICATOR - WALL MOUNT
	REMOTE ALARM INDICATING AND TEST SWITCH
	REMOTE INDICATOR - CEILING MOUNT

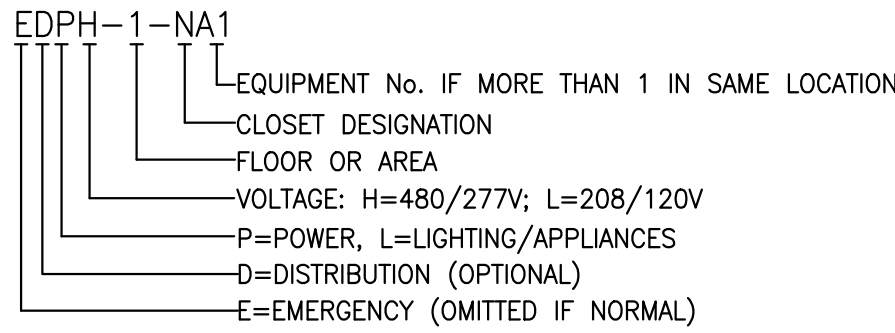
ABBREVIATIONS

+	SPECIAL MOUNTING HEIGHT. COORDINATE LOCATION WITH ARCHITECTURAL ELEVATIONS
1P	SINGLE POLE
2P	TWO POLE
3P	THREE POLE
A	AMPERE
AFF	ABOVE FINISHED FLOOR
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
CAB	CABINET
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
CTL	CONTROL
CONN	CONNECTED
CONT	CONTINUATION
CU	COPPER
DEG	DEGREE
°C	DEGREE CELSIUS
°F	DEGREE FAHRENHEIT
DIA	DIAMETER
DISC	DISCONNECT
DN	DOWN
DP	DISTRIBUTION PANEL BOARD
DWG	DRAWING
(E)	EXISTING TO REMAIN
EA	EACH
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRICAL
EM	EMERGENCY
EQUIP	EQUIPMENT
(ER)	EXISTING TO BE REMOVED
(ERR)	EXISTING TO BE REMOVED & RELOCATED
EXIST,EX	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAP	FIRE ALARM ANNUNCIATOR PANEL
FDR	FEEDER
FIXT	FIXTURE
FL	FLOOR
FLA	FULL LOAD AMPERES
FLEX	FLEXIBLE
FLUOR	FLUORESCENT
G	GROUND
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
HP	HORSE POWER
HZ	HERTZ
IG	ISOLATED GROUND
INCAND	INCANDESCENT
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LITG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MH	MAN-HOLE
MLO	MAIN LUG ONLY
MTD	MOUNTED
N	NEUTRAL
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
P	POLE
PB	PULL BOX
ø	PHASE
PNL	PANEL
PWR	POWER
(RE)	RELOCATED EXISTING
RECEPT,REC	RECEPTACLE
(RRO)	EXISTING TO BE REMOVED AND RETURN TO OWNER
SCHED,SCH	SCHEDULE
SPEC	SPECIFICATION
SPKR	SPEAKER
SW	SWITCH
SYS	SYSTEMS
TRANSF,XFMR	TRANSFORMER
UON	UNLESS OTHERWISE NOTED
V	VOLT OR VOLTAGE

ELECTRICAL DEMOLITION NOTES

- THE CONTRACTOR SHALL INCLUDE IN THEIR BID ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF ELECTRICAL WORK AS DESCRIBED IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE ARCHITECT.
- THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ARCHITECTURAL AND ELECTRICAL LAYOUTS IN FULL COORDINATION WITH THE ARCHITECT'S DEMOLITION PLANS. ALL SYSTEMS WHICH ARE NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED AND DISCONNECTED AT THE SOURCE OF POWER SUPPLY.
- THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE WITH FUNCTIONING ELECTRICAL SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.
- DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
- THE CONTRACTOR SHALL REMOVE ALL ELECTRICAL OUTLETS, SWITCHES AND OTHER DEVICES, COMPLETE WITH ASSOCIATED WIRING, CONDUITS, ETC., FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING WIRING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND OTHER DEVICES AND PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE CIRCUITS AFFECTED CONTINUOUS AND READY FOR OPERATION. OTHERWISE, WIRING SHALL BE REMOVED BACK TO THE NEAREST ELECTRICAL JUNCTION BOX THAT IS TO REMAIN OR TO PANELBOARD.
- ALL RACEWAYS WHICH BECOME EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
- ALL UNUSED OUTLET BOXES OR CAPPED FLOOR OUTLETS SHALL BE PROVIDED WITH MATCHING BLANK COVERS.
- EXISTING PANEL DIRECTORIES AFFECTED BY THE ALTERATION WORK SHALL BE MODIFIED TO REFLECT THE BRANCH CIRCUIT WIRING CHANGES.
- PORTIONS OF FEEDER RUNS TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ENERGIZED, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED. NEW FEEDER EXTENSIONS SHALL MATCH EXISTING ONES IN ALL RESPECTS, CABLE TYPE, CONDUCTOR AMPACITY, CONDUIT SIZES, ETC.
- THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS. THE CONTRACTOR SHALL FOLLOW CLOSELY THE ARCHITECT'S DEMOLITION AND PHASING SCHEDULE AND PROCEED IN THE SPECIFIED SEQUENCE.
- ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACT, SHALL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THE ELECTRICAL CONTRACTOR, AS DIRECTED BY THE OWNER.
- ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVER TIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.
- THE SHUTDOWN OF EXISTING BUILDING ELECTRICAL SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.

NEW EQUIPMENT DESIGNATIONS



ELECTRICAL GENERAL NOTES

- GENERAL NOTES, SYMBOL LIST AND DETAILS ARE APPLICABLE TO ALL ELECTRICAL DRAWINGS.
- ALL WORK IS NEW UNLESS OTHERWISE NOTED.
- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED WHERE REQUIRED BY STRUCTURE. PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
- PASS RACEWAYS OVER WATER, STEAM OR OTHER PIPING WHEN PULL BOXES ARE NOT REQUIRED. NO RACEWAY WITHIN 3 INCHES OF STEAM OR HOT WATER PIPES OR APPLIANCES (EXCEPT PIPE CROSSINGS WHERE RACEWAY SHALL BE AT LEAST 1 INCH FROM PIPE COVERS).
- CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREAD OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.
- HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS ARE NOT PERMITTED. DO NOT RUN CONDUIT IN PRECAST ROOF SLABS, IN 2 INCH SLABS OR IN TERRAZZO FLOOR FINISH.
- LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
- SET BOXES SQUARE AND TRUE WITH BUILDING FINISH. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRONS.
- VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT. VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE, CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
- LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS AT OR NEAR DOORS. COORDINATE WITH ARCHITECT AND INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL HINGE LOCATIONS IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.
- COVERS OF JUNCTION AND PULLBOXES SHALL BE READILY ACCESSIBLE.
- PROVIDE PULLBOXES WHERE INDICATED, WHERE REQUIRED BY CODE AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE. COORDINATE PULLBOX LOCATIONS WITH OTHER TRADES.
- EMPTY RACEWAY RUNS. PROVIDE PULLBOXES EVERY 100 FT AND AS INDICATED. COORDINATE LOCATIONS WITH OTHER TRADES.
- JUNCTION AND PULLBOXES: LOCATE GENERALLY NOT EXPOSED IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT.
- SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
- ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
- CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
- PROVIDE 2#14 INDICATING PILOT LIGHT WIRES FROM PILOT LIGHT IN CONTROLLER TO LOAD SIDE OF DISCONNECT SWITCH. RUN WIRES IN BRANCH CIRCUIT CONDUIT AND INCREASE CONDUIT SIZE AS REQUIRED.
- PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32°F (0°C). PROVIDE CABLE SUPPORTS FOR WIRE IN RISER CONDUITS AS REQUIRED BY CODE.
- PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF NORMAL AND EMERGENCY CIRCUITS. COMMON BOXES: PROVIDE BARRIERS BETWEEN EMERGENCY AND NORMAL WIRING.
- HEIGHTS OF OUTLETS FROM FINISHED FLOOR TO CENTERLINE OF OUTLET:

RECEPTACLES AND TELEPHONES:	
GENERALLY	1'-6"
OVER WORK BENCHES	3'-6"
WALL SWITCHES	4'-0"
WALL FIXTURES	7'-0"
MOTOR CONTROLLERS	5'-0"
GONGS AND HORNS	7'-6"
FIRE ALARM STATIONS	4'-0"
CLOCKS	7'-6"
STROBE LIGHTS	6'-8" TO BOTTOM

EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE REQUIREMENTS, AS NOTED OR DIRECTED.

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND CONFIRMING ALL MOUNTING HEIGHTS WITH ARCHITECT AND ARCHITECTURAL DRAWINGS.
- WIRE COLOR CODING: AS PER CODE. WHERE COLOR-CODED CABLE IS NOT AVAILABLE: CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING OF CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.
- INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS: ONLY WITH WRITTEN CONSENT OF OWNER. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES. ALARM AND EMERGENCY SYSTEMS ARE NOT TO BE INTERRUPTED.
- FIRESTOPPING SHALL BE INSTALLED WHENEVER WIRING OR RACEWAYS CROSS FIRE RATED CONSTRUCTION.



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No.	Date	Description
ISSUE		

PROJECT
Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING TITLE ELECTRICAL COVER SHEET	
Drawn By DA	Drawing No.
Checked By FM	
Date 11/13/2020	
Scale NTS	
Project No. 190911-000	

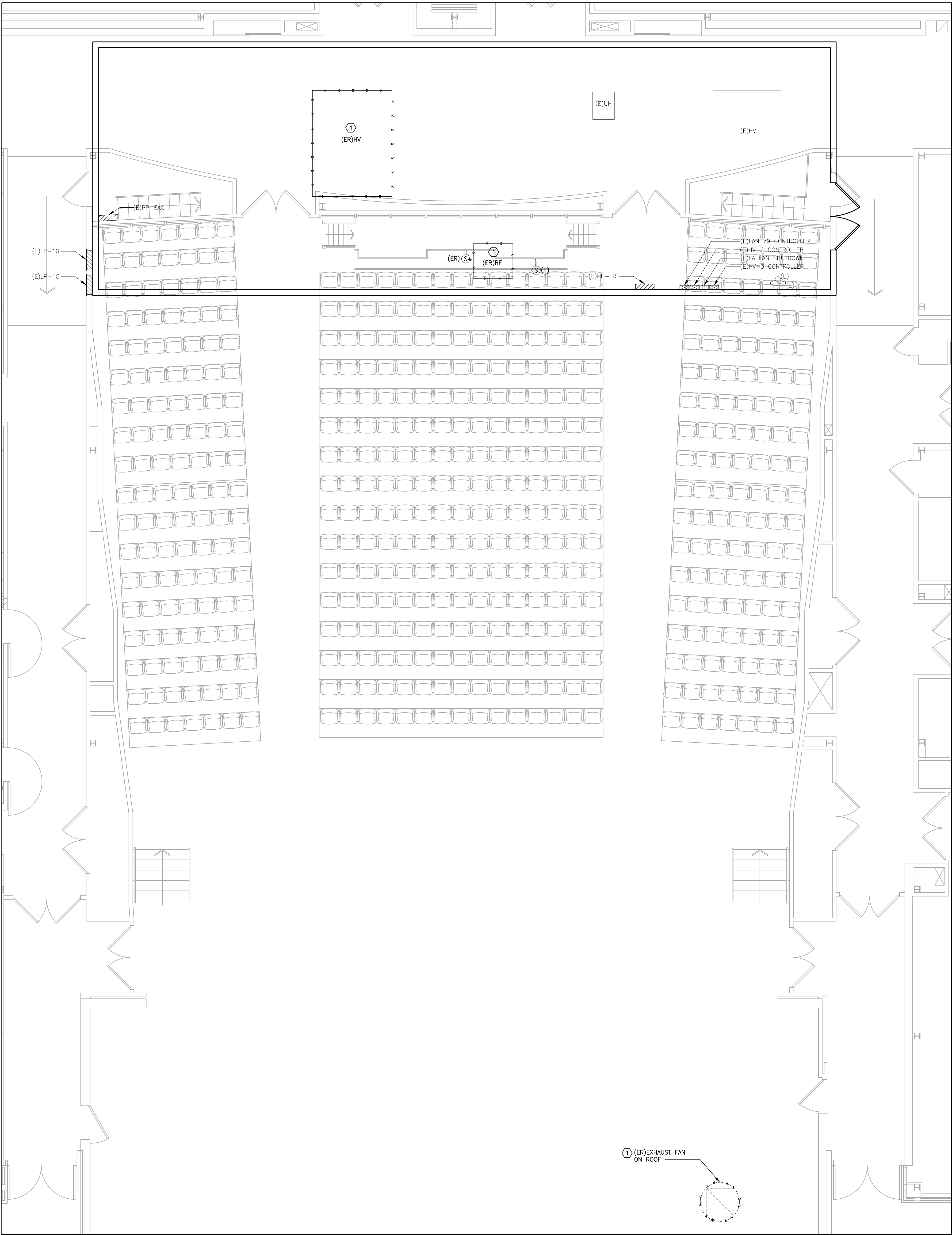
DRAWING INDEX	
DRAWING NO.	DRAWING TITLE
E-000	ELECTRICAL COVER SHEET
E-100	ELECTRICAL FLOOR PLAN - DEMOLITION
E-200	ELECTRICAL FLOOR PLAN - POWER
E-300	ELECTRICAL RISER DIAGRAM
E-400	ELECTRICAL DETAILS AND SCHEDULES
E-500	ELECTRICAL SPECIFICATIONS
E-501	ELECTRICAL SPECIFICATIONS

DRAWING NOTES

1. COORDINATE ALL WORK WITH MECHANICAL CONTRACTOR

KEY NOTES:

- ① PROVIDE A COMPLETE ELECTRICAL DEMOLITION OF EXISTING MECHANICAL EQUIPMENT BEING REMOVED BY OTHER DIVISIONS TO INCLUDE ALL ASSOCIATED WIRING BACK TO SOURCE PANEL



MEZZANINE MER PLAN
SCALE: 1/4" = 1'-0"

No.	Date	Description
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ISSUE		

PROJECT

PROJECT

Greenwich Public Schools

WMS Auditorium AC Upgrade

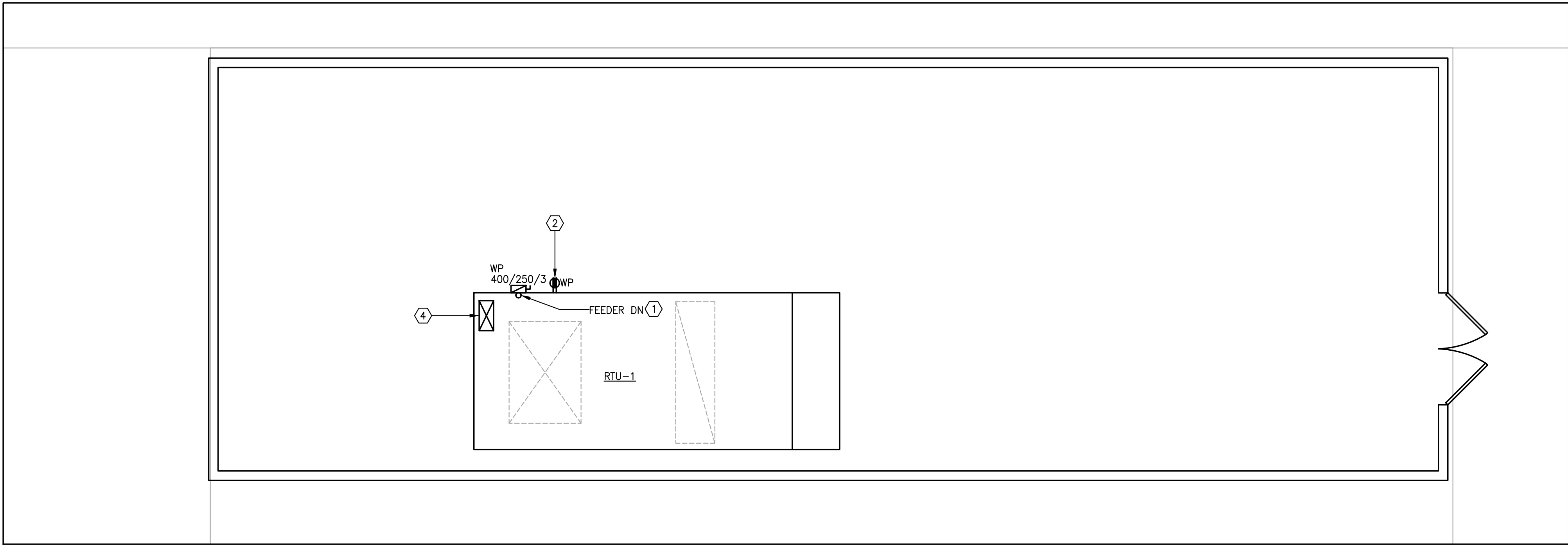
WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING TITLE

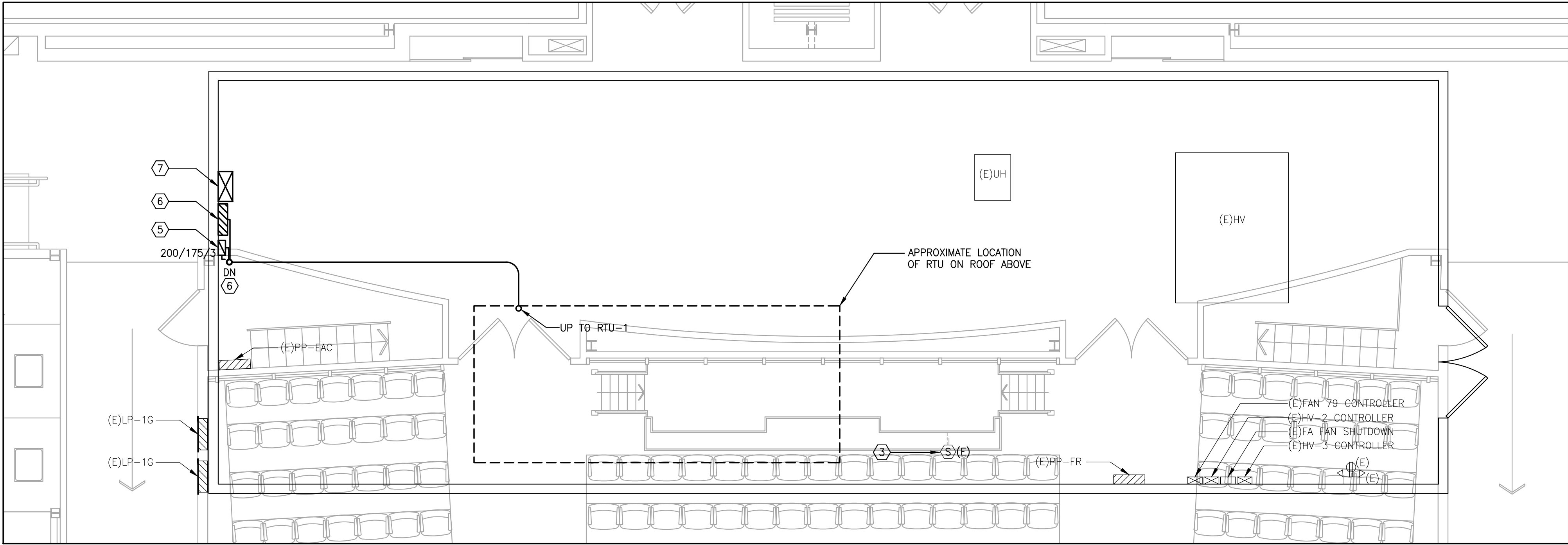
ELECTRICAL
FLOOR PLAN -
DEMOLITION

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Checked By	FM	
Date	11/13/2020	
Scale	1/8"=1'-0"	
Project No.	190911-000	

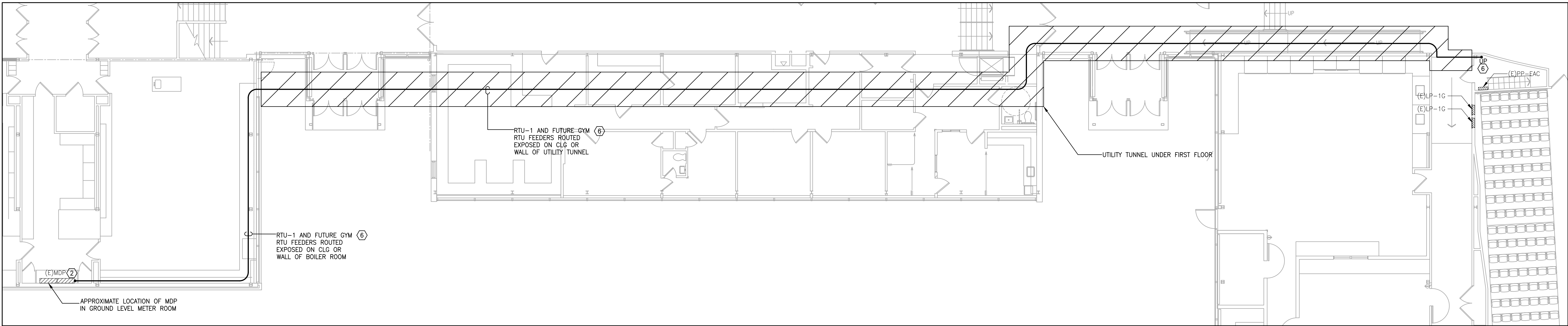
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SAVE DATE: 11/13/2020 11:50 AM
LOGIN: No. Alexander



PARTIAL ROOF PLAN
SCALE: 1/4" = 1'-0"



MEZZANINE MER PLAN
SCALE: 1/4" = 1'-0"



PARTIAL GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"

- DRAWING NOTES:
- COORDINATE ALL WORK WITH MECHANICAL CONTRACTOR
- KEY NOTES:
- FEED NEW RTU-1 FROM NEWLY INSTALLED 250A/3P BREAKER IN MDP VIA 3#350+1#4G-3" C (SIZED FOR VOLTAGE DROP). NEW BREAKER SHALL MATCH EXISTING IN MFG. TYPE, AIC, AND IN KIND. INCLUDE ALL MODIFICATIONS TO SWITCHBOARD FOR THE ADDITION OF NEW BREAKER.
 - WIRE RTU-1 SERVICE RECEPTACLE TO NEWLY INSTALLED 20A/1P BREAKER VIA 2#12+1#12G-3/4" C IN MEZZANINE PANEL PP-EAC.
 - EXISTING DUCT SMOKE DETECTOR IN SUPPLY DUCT OF RTU-1 (MEZZANINE MER).
 - PROVIDE FA MODULE WITH RELAY IN MEZZANINE AREA CONNECTED TO RTU-1 CONTROLLER FOR FAN SHUTDOWN. WIRE TO EXIST FA SLC (SIGNALING LINE CIRCUIT) SERVING AREA.
 - FEED FUTURE GYM RTU FROM NEWLY INSTALLED 175A/3P BREAKER IN MDP VIA 3#3/0+1#6G-3" C (SIZED FOR VOLTAGE DROP). NEW BREAKER SHALL MATCH EXISTING IN MFG. TYPE, AIC, AND IN KIND. INCLUDE ALL MODIFICATIONS TO SWITCHBOARD FOR THE ADDITION OF NEW BREAKER.
 - PROVIDE SEPARATE PRICING, IN LIEU OF KEY NOTE 1&5 FOR A 700A FDR VIA 2 SETS OF 4#500KCMIL+1/0G IN 2-4" C TO A NEW MEZZ 800A RATED POWER PANEL WITH BRANCH BREAKERS (400A & 250A) TO SERVE RTU-1 AND FUTURE GYM RTU. INCLUDE WITH A NEWLY INSTALLED 800AF/700AT FEEDER BREAKER IN MDP AND ALL REQUIRED MODIFICATIONS TO SWITCHBOARD.
 - WIRE RTU-1 BMS CONTROL PANEL TO NEWLY INSTALLED 20A/1P BREAKER VIA 2#12+1#12G-3/4" C IN MEZZANINE PANEL PP-EAC.

AKF

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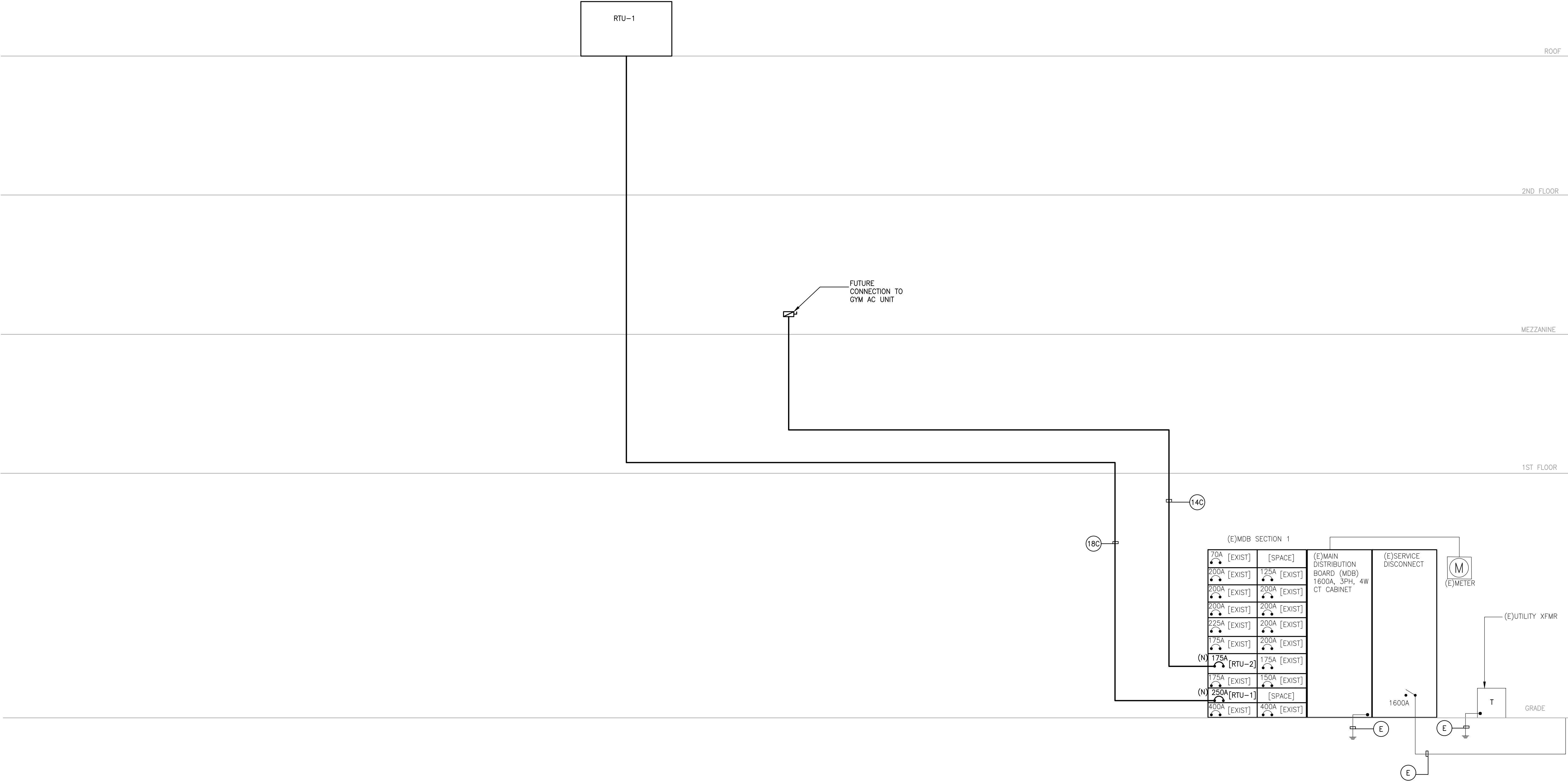
Leadership in Engineering & Integrated Services

No.	Date	Description
REVISION		
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
ISSUE		
PROJECT		
Greenwich Public Schools		
WMS Auditorium AC Upgrade		
1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT		
DRAWING TITLE		
ELECTRICAL FLOOR PLAN - POWER		
Drawn By	DA	Drawing No.
Checked By	FM	E-200
Date	11/13/2020	
Scale	1/8"=1'-0"	
Project No.	190911-000	

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PLOT DATE: 11/20/2020 2:06 PM
SAVE DATE: 11/13/2020 11:50 AM
LOGIN: Koz, Alexander

NOTE:
1. THE SCHEDULE IS BASED ON COPPER, 600 VOLT WIRE TYPE XHHW-2 AND EMT/RGS CONDUIT
(2B) NUMBER INDICATES FEEDER SIZE IN AMPS AND WIRE
LETTER INDICATES CONDUIT SIZE AND NUMBER OF WIRES

WIRE & CONDUIT SIZING SCHEDULE						
AMPS	TAGS	WIRE SIZE (AWG/KCMIL)		No. OF WIRES AND CONDUIT SIZE (IN INCHES)		
		CONDUCTOR PHASE AND NEUTRAL	GROUND	A 1PH, 2W+G	B 3PH, 3W+G	C 3PH, 4W+G
E		EXISTING FEEDER				
50	5	6	10	3/4	1	1
60	6	4	10	1	1 1/4	1 1/4
70	7	4	8	1	1 1/4	1 1/4
80	8	3	8	1	1 1/4	1 1/4
90	9	2	8	1 1/4	1 1/4	1 1/2
100	10	1	8	1 1/4	1 1/2	2
125	11	1	6	1 1/4	1 1/2	2
150	12	1/0	6	1 1/2	2	2
175	13	2/0	6	1 1/2	2	2 1/2
200	14	3/0	6	2	2	2 1/2
225	15	4/0	4	2	2 1/2	2 1/2
250	16	250	4	2	2 1/2	3
275	17	300	4	2 1/2	3	3
300	18	350	4	2 1/2	3	3
350	19	500	3	3	4	4
400	20	600	3	3	4	4
450	21	(2)4/0	(2)2		(2)2 1/2	(2)2 1/2
500	22	(2)250	(2)2		(2)2 1/2	(2)3
600	23	(2)350	(2)1		(2)3	(2)4
600A	23D	(3)350	(3) 2/0			(3)4
700	24	(2)500	(2)1/0		(2)3 1/2	(2)4
800	25	(2)600	(2)1/0		(2)4	(2)4
1000	26	(3)500	(3)2/0		(3)3 1/2	(3)4
1600	27	(4)600	(4)4/0		(4)4	(4)4
2000	28	(5)600	(5)4/0		(5)4	(5)4
2500	29	(7)500	(7)350		(7)4	(7)4
3000	30	(8)600	(8)600		(8)4	(8)4



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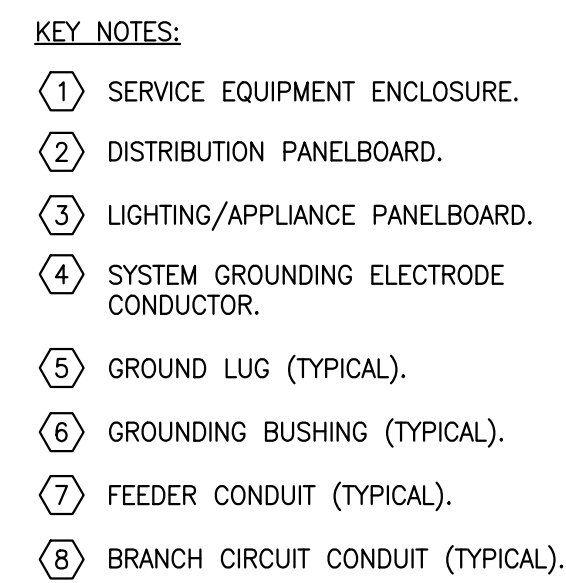
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PROJECT
Greenwich Public Schools
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1 WESTERN JUNIOR HIGHWAY
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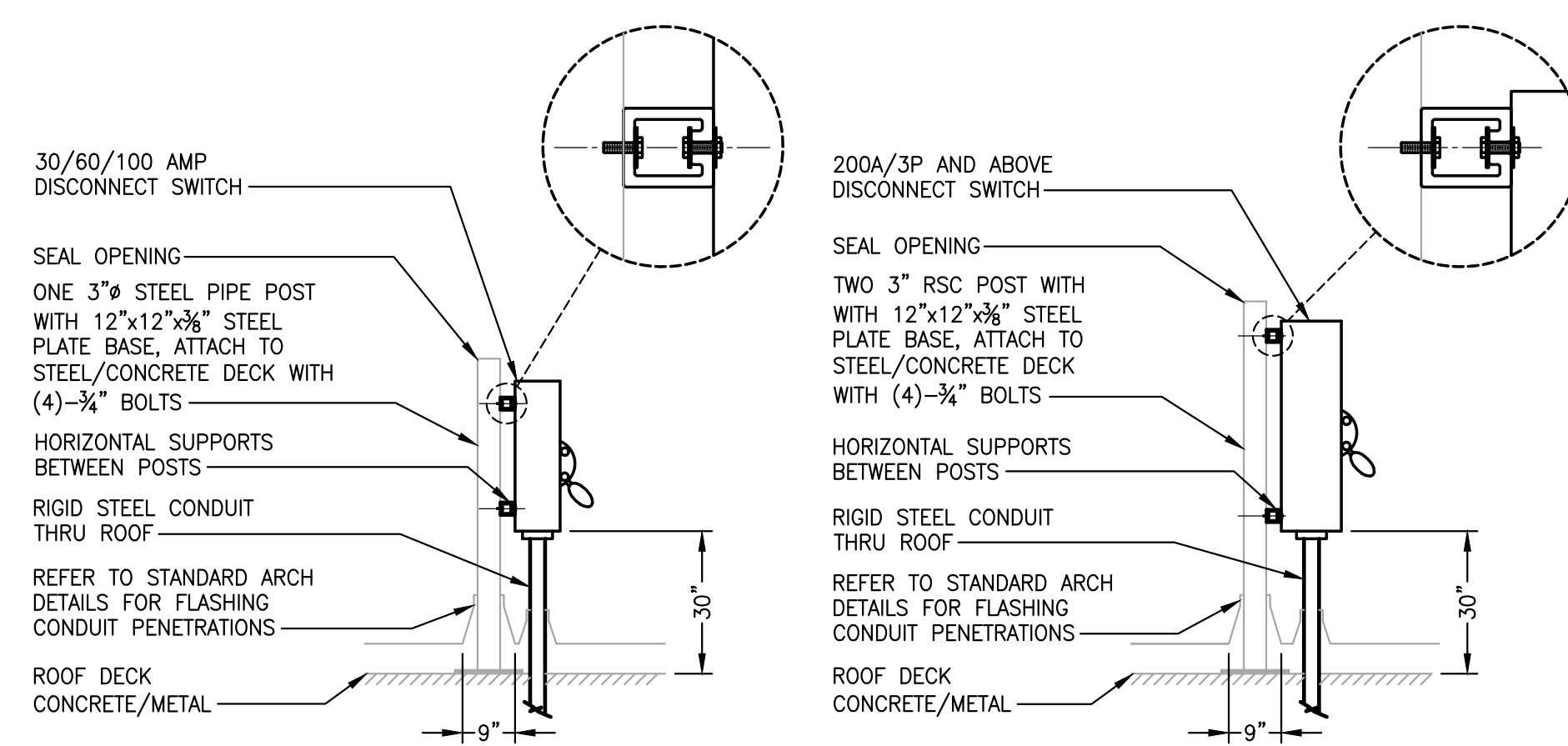
DRAWING TITLE
ELECTRICAL
RISER DIAGRAM

Drawn By	DA	Drawing No.
Checked By	FM	E-300
Date	11/13/2020	
Scale	NTS	
Project No.	190911-000	

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- KEY NOTES:**
- | | |
|---|--|
| <p>① MAIN GROUNDING ELECTRODE CONDUCTOR FROM BUILDING SERVICE NEUTRAL.</p> <p>② GROUND ELECTRODE BUS, WALL MTD EXTERNAL WITHIN SERVICE EQUIPMENT.</p> <p>③ GROUNDING ELECTRODE CONDUCTOR.</p> <p>④ GROUNDING ELECTRODE SYSTEM (GROUND ROD).</p> <p>⑤ GROUNDING ELECTRODE (UG METAL COLD WATERPIPE). WHERE CONDUCTORS ARE INSTALLED IN CONDUIT, CONDUIT SHALL ALSO BE BONDED TO RESPECTIVE GROUNDING ELECTRODES.</p> | <p>⑥ WATER METER WITH JUMPER.</p> <p>⑦ GROUND CLAMP ASSEMBLY (TYP. ONE PER CONDUCTOR).</p> <p>⑧ GROUNDING ELECTRODE (BUILDING STEEL).</p> <p>⑨ BOND TO BUILDING STEEL.</p> <p>⑩ GROUNDING ELECTRODE (RE-BAR AT BOTTOM OF FOOTING).</p> |
|---|--|

G15 GROUNDING ELECTRODE SYSTEM
(STEEL BUILDINGS)



EM10 ROOF MOUNTED DISCONNECT SWITCHES
ROOF DECK - TYPICAL DETAIL

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND BUILDING STRUCTURE. PROVIDE CLEARANCE FROM WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR SUSPENDED CEILING OUTLETS, RUN ABOVE CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS AND SHALL BE UTILIZED WHERE RUN IN MECHANICAL ROOMS, OUTDOORS, EXPOSED CEILINGS, OR IN CONCRETE SLABS. JOINT MALLE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, ORC-COLD GALVANIZED.

EMT SHALL BE PERMITTED FOR INTERIOR FEEDERS AND BRANCH CIRCUITS, IN DRY LOCATIONS, DRY WALLS, EXPOSED CEILINGS (WHEN NOT SUBJECT TO PHYSICAL DAMAGE), SUSPENDED CEILINGS, HOLLOW BLOCK WALLS, FURRED SPACES AND WHERE NOT SUBJECT TO PHYSICAL DAMAGE.

FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS PRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALLE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION FOR EXPANSION JOINT CROSSINGS. CROSS AT RIGHT ANGLES AND ANCHOR ENDS. FOR RACEWAY NOT IN SLAB, PROVIDE FLEXIBLE CONDUIT WITH EXTERNAL BONDING JUMPER STRIP. IN SLAB, PROVIDE 0-2/GEDNEY TYPE "AX" OR APPLETON TYPE "XJ" OR "XJF" WITH GROUND CONTINUITY.

C. FOR THROUGH-THE-FLOOR SYSTEMS (FIRE RATED POKE-THRU), UTILIZE AN ASSEMBLY SIMILAR TO WIREMOLD EVOLUTION SERIES AV6 FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR CONFERENCE ROOMS UTILIZE AN ASSEMBLY SIMILAR TO WIREMOLD EVOLUTION SERIES AV8. FOR ABOVE FLOOR FITTINGS POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN ELECTRICAL AND MECHANICAL COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR. FLOOR BOXES FOR FURNITURE SYSTEMS SHALL UTILIZE SEPARATE FIRE RATED POKE-THRUS FOR POWER AND TEL/DATA. WIREMOLD TYPE RC-9 MAY BE UTILIZED FOR EACH POWER AND TEL/DATA IN-FEED LOCATION WITH 2 INCH CONDUIT CONNECTION FOR EACH IN-FEED CONNECTION.

D. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

E. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS AS REQUIRED FOR ACCESSIBILITY. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENINGS CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

F. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE PARTITIONS.

G. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS. ANY FEEDERS FOUND TO EXCEED THIS TOLERANCE SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

13. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG AND/OR KCMIL EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 75FT UP TO 100 FT CIRCUIT LENGTH, PROVIDE NO. 10 MINIMUM. AT 277 VOLTS AND OVER 150FT UP TO 250 FT CIRCUIT LENGTH, PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH, PROVIDE NO. 12 MINIMUM.

D. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN CODE MAXIMUM VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

E. INSULATION SHALL BE RUBBER AND THERMOPLASTIC, 90 DEG C MEETING ASTM AND IECE STANDARDS. TYPE THHN/THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. SFF-2 SHALL BE USED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS ROW FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG. C. UNDERGROUND SERVICE ENTRANCE CABLING SHALL BE USE. PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW) IN EXTERIOR LOCATIONS INCLUDING UNDERGROUND NON-SERVICE CABLES.

F. METAL-CLAD CABLE (TYPE MC) WITH GROUND WIRES MAY BE UTILIZED WHEN PERMITTED BY BUILDING RULES AND REGULATIONS FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. TYPE MC CABLE MAY NOT BE INSTALLED IN EXPOSED CEILINGS WITHOUT WRITTEN APPROVAL BY ARCHITECT AND ENGINEER, WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF MC CABLE. MC CABLE SHALL INCLUDE COPPER CONDUCTORS AND STEEL OR LIGHTWEIGHT STEEL JACKET. TYPE MC CABLE UTILIZED IN HEALTH CARE FACILITIES AND AREAS AS DEFINED BY THE NATIONAL ELECTRICAL CODE ARTICLE 517 SHALL BE EQUIVALENT TO AFC CABLE SYSTEMS HCF-90 AND UTILIZED FOR NORMAL CIRCUITS ONLY. BX CABLE (TYPE AC) SHALL NOT BE UTILIZED. ALL BRANCH CIRCUIT HOMERUNS AND WIRING WITHIN ELECTRICAL CLOSETS SHALL BE RUN IN CONDUIT.

G. COLOR CODING SHALL BE AS FOLLOWS:

1) 120/208 VOLT SYSTEM:
BLACK FOR A PHASE
RED FOR B PHASE
BLUE FOR C PHASE

2) 277/480 VOLT SYSTEM:
BROWN FOR A PHASE
ORANGE FOR B PHASE
YELLOW FOR C PHASE

3) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

H. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING, INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS. SIMILAR TO STRANCO PRODUCTS, INC.

I. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTI-SEIZE COMPOUND.

- J. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. IF MORE THAN THREE CIRCUITS, DERATE WIRE CURRENT CARRYING CAPACITY AND MAINTAIN CODE REQUIREMENTS FOR CONDUIT FILL. NEUTRAL CONDUCTOR SHALL BE COUNTED AS A CURRENT CARRYING CONDUCTOR. SUBMIT TO ENGINEER FOR REVIEW AND/OR TO INSTALLATION. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF NORMAL AND EMERGENCY SYSTEMS. 120/208 AND 277/480 VOLT SYSTEMS. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- K. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- L. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND MOTOR BRANCH CIRCUITS OVER 25 HP. PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
14. GROUNDING
- A. A SEPARATE EQUIPMENT GROUNDING CONDUCTOR COMMONLY DESCRIBED AS A 'GREEN WIRE' SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS PROTECTED BY OVERCURRENT DEVICES. A 'GREEN WIRE' GROUND SHALL ALSO BE PROVIDED FOR FLEXIBLE CONDUIT AND MOTOR CIRCUITS. METALLIC RACEWAY CONTINUITY SHALL BE MAINTAINED WITH A BARE NO. 6 WIRE. WHERE ISOLATED GROUNDING BRANCH CIRCUITS ARE USED, PROVIDE A SEPARATE AND DISTINCTLY MARKED GREEN GROUND WIRE. EACH GROUNDING CONDUCTOR SHALL SERVE A MAXIMUM OF THREE CIRCUITS/POLES.
- B. SERVICE AND EQUIPMENT:
- 1) FOR SEPARATELY DERIVED SERVICES AND ALL SERVICE SWITCHES, GROUND THE NEUTRAL CONDUCTOR THROUGH DISCONNECTING LINK AND GROUND TERMINAL TO WATER SERVICE GROUND CLAMP, BUILDING STEEL AND DRIVEN GROUND RODS.
- 2) GROUND THE CENTER TAP OF Y-COCONNECTED TRANSFORMERS THROUGH SECONDARY NEUTRAL AND GROUND BUS TO WATER SERVICE GROUND CLAMP. CONNECTIONS TO BUILDING STEEL WILL BE CONSIDERED ONLY WHERE PERMITTED BY CODE AND BY APPROVAL.
- 3) GROUND CLAMPS SHALL BE BRONZE, SOLDERLESS TYPE WITH BRONZE SCREWS, SUITABLE FOR RECEIVING NOTED CONDUCTORS. MOUNT GROUND CLAMP ON WATER SERVICE AT STREET SIDE OF MAIN SERVICE VALVE. PROVIDE JUMPER TO BY-PASS WATER METER.
- C. RUN INSULATED GROUND CONDUCTORS IN RIGID METALLIC CONDUIT WITH CONDUCTOR CONNECTED TO CONDUIT, THROUGH GROUND FITTING AT EACH END.
- D. GROUND NONCURRENT CARRYING METAL PARTS OF DISTRIBUTION PANELS, SWITCHBOARDS, TRANSFORMER ENCLOSURES, RACEWAYS, ENCLOSURES, CONTROLLER ENCLOSURES, MOTOR FRAMES AND OTHER ELECTRICAL EQUIPMENT.
- E. ALL COMPONENTS FOR GROUNDING SYSTEMS SHALL BE UL 467 LISTED.
- F. MISCELLANEOUS:
1. GROUND THE FOLLOWING:
- a. TEL/DATA/AUDIO-VISUAL SYSTEMS
- b. FIRE ALARM SYSTEM.
- c. LINE AND LOAD SIDE OF A VFD.
15. POWER WIRING
- A. PROVIDE ALL POWER WIRING IN CONDUIT TO ALL MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS ON THE PROJECT. INCLUDE EXTENSIONS FROM CONTROLLERS TO MOTORS AND MOTOR CONNECTIONS. MOUNT AND WIRE ALL CONTRACTORS AND POWER DEVICES FURNISHED UNDER ALL CONTRACTS.
- B. PROVIDE ONE (1) DEDICATED 120V 20A CIRCUIT FOR EACH HVAC CONTROL PANEL. COORDINATE QUANTITY AND LOCATION WITH HVAC/BMS CONTRACTOR.
16. CONTROL WIRING
- A. PROVIDE ALL CONTROL WIRING IN CONDUIT FOR MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS AND AS SPECIFICALLY SHOWN ON THE DRAWINGS AND SPECIFICATIONS. INCLUDE MOUNTING AND WIRING OF ALL CONTROL DEVICES FURNISHED WITH EQUIPMENT.
17. WIRING DEVICES:
- A. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED BY LEVITON, HUBBELL, OR EQUAL. ALL DEVICE TYPES, FINISH AND COLOR ARE SUBJECT TO APPROVAL BY ARCHITECT.
- B. LOCAL WALL SWITCHES SHALL BE SPECIFICATION GRADE, TOGGLE, QUIET TYPE, RATED 20 AMP, 120/277 VOLT, AC. ALL SWITCHES SHALL BE GANGED WITH MULTI DEVICE PLATES, IN AREAS WHERE DIMMERS ARE SPECIFIED WITH WALL SWITCHES; ALL SWITCHES SHALL MATCH DIMMER SERIES AND SHALL BE GANGED TOGETHER. WHERE TABS FROM DIMMERS ARE REMOVED, FOLLOW MANUFACTURERS DE-RATING AND UP-SIZE DIMMER AS APPROPRIATE.
- SIMILAR TO:
- 1) IN FINISHED AREAS ARCHITECTURAL TYPE ROCKER SWITCH: LEVITON DECORA PLUS #5621-2 (SINGLE POLE), 5622-2 (DOUBLE POLE), 5623-2 (THREE WAY), 5624-2 (FOUR WAY).
- 2) ALL OTHER AREAS HEAVY-DUTY INDUSTRIAL TYPE TOGGLE SWITCH: LEVITON 1221-2 (SINGLE POLE), 1222-2 (DOUBLE POLE), 1223-2 (3 WAY), 1224-2 (4 WAY).
- 3) LOOKING TYPE: LEVITON 1221-21 (SINGLE POLE), 1222-21 (DOUBLE POLE), 1223-2L (THREE WAY), 1224-2L (FOUR WAY).
- 4) ILLUMINATED SWITCHES FOR FINISHED AREAS: LEVITON DECORA PLUS #5631-2 (SINGLE POLE, 120V).
- 5) ILLUMINATED SWITCHES FOR UNFINISHED AREAS: TOGGLE TYPE; LEVITON #1221-LH.
- 6) COMBINATION DUPLEX AND USB CHARGER: LEVITON #T5832W
- 7) PILOT LIGHT SWITCHES IN FINISHED AREAS: LEVITON DECORA PLUS #5628-2 (SINGLE POLE).
- 8) PILOT LIGHT SWITCHES IN UNFINISHED AREAS: LEVITON DECORA PLUS # 1221-PLC (SINGLE POLE).
- C. INSERTION RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE HEAVY DUTY DUPLEX CONVENIENCE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP WITH U GROUND SLOT GROUNDED, EXCEPT AS NOTED. DEVICE SHALL BE SIMILAR TO HUBBELL #HBL5362 OR EQUAL BY LEVITON, ARROW HART OR PASS & SEYMOUR LEGRAND OR GE. FACE COLOR SHALL BE SELECTED BY OWNER OR ARCHITECT. DEVICES USED ON EMERGENCY BRANCH CIRCUITS SHALL BE RED FACE ONLY. INSERTION RECEPTACLES SHALL MEET LATEST NEMA STANDARDS, PUBLICATION WD-6, FEDERAL SPECIFICATION W-C-596 AND BE UL LISTED TO UL498.
- SIMILAR TO:
- 1) IN FINISHED AREAS ARCHITECTURAL TYPE DECORATOR SERIES FOR ALL TYPES NOTED BELOW. FOR DUPLEX RECEPTACLES COMMERCIAL SPECIFICATION GRADE: LEVITON DECORA PLUS #16351-W (SINGLE POLE), 16352-W (DOUBLE POLE).
- 2) IN AREAS DEFINED BY NEC 406.12: LEVITON, SMOOTH FACE ILLUMINATED DUPLEX RECEPTACLE #M8300-ILW (TAMPER RESISTANT MT830-ILW) OR DECORA PLUS LINE M1636-ILW (TAMPER RESISTANT MT163-ILW).
- a) ISOLATED GROUND: LEVITON, SMOOTH FACE ILLUMINATED RECEPTACLE #M8300-IGW (TAMPER RESISTANT MT830-IGW) OR DECORA PLUS M0830-IGW (TAMPER RESISTANT MT083-IGW).
- b) OTHER AREAS: EXTRA HEAVY-DUTY HOSPITAL GRADE SMOOTH FACE, LEVITON #M8300-W (TAMPER RESISTANT MT8300-W) OR DECORA PLUS #M1636-HGW (TAMPER RESISTANT #MT163-HGW).
- 3) COMBINATION DUPLEX RECEPTACLE AND USB CHARGER: LEVITON T832 20A 120V DUPLEX RECEPTACLE WITH DUAL 3.6A 5.0VDC TYPE A USB CHARGERS
- 4) ALL OTHER AREAS: EXTRA HEAVY DUTY SPECIFICATION GRADE: LEVITON #M5362-W OR DECORA PLUS M1636-W.
- a) ISOLATED GROUND: LEVITON #M5362-IGW OR DECORA PLUS #M1636-IGW.

- 5) SINGLE RECEPTACLES- COMMERCIAL SPECIFICATION GRADE: LEVITON #5361 OR DECORA # 16352.
- 6) SPECIAL USE: NON-INTERCHANGEABLE TYPES AND RATINGS CARRYING CAPACITY AND MAINTAIN CODE REQUIREMENTS FOR CONDUIT FILL.
- 7) CLOCKS: SINGLE RECESSED RECEPTACLE SIMILAR TO LEVITON #5361-CH.
- 8) GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE WITH SELF-PROTECTION AND LED INDICATOR LIGHT. SIMILAR TO HUBBELL #GF5362 OR EQUAL BY LEVITON, ARROW HART OR PASS & SEYMOUR LEGRAND.
- a) GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES IN DAMP LOCATIONS SHALL BE WEATHER RESISTANT
- b) GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES IN WET LOCATIONS SHALL BE WEATHER RESISTANT WITH METALLIC WHILE-IN-USE COVER.
- 9) SURGE PROTECTION RECEPTACLES: SHALL BE BACK AND SIDE WIRED WITH A MAXIMUM SINGLE PULSE RATING OF 24KA, L-N. LEVITON #5380 (20 AMP).
- d) ISOLATED GROUND: LEVITON 5380-IG (20 AMP).
- D. MOMENTARY CONTACT SWITCHES. FOR REMOTE CONTROL SWITCHES, SIMILAR TO LEVITON #1257.
- E. PILOT LIGHTS: NEON LAMP, SIMILAR TO HUBBELL NO. 11375, WITH 125-VOLT LAMP.
- F. DEVICE PLATES: COORDINATE WITH ARCHITECT FOR FINAL TYPE, COLOR, MATERIAL AND FINISH. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
- 1) BRUSHED 302 STAINLESS STEEL WITH ENGRAVED CIRCUIT IDENTIFICATION PLATE WHEN USED TOGETHER WITH EMERGENCY BRANCH CIRCUIT DEVICE.
- 2) IF PERMITTED BY ARCHITECT AND BUILDING STANDARD, REINFORCED THERMOPLASTIC BY SAME MANUFACTURER OF DEVICES.
- G. COLORS: AS SPECIFIED AND COORDINATED WITH ARCHITECT.
- H. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.
18. EMPTY CONDUIT SYSTEMS:
- A. PROVIDE COMPLETE SYSTEM OF EMPTY CONDUIT, FITTINGS, PULL BOXES, OUTLETS, SLEEVES AND FISH/PULLING WIRES.
- B. EQUIPMENT AND INSTALLATION SHALL CONFORM TO REQUIREMENTS OF THE TELECOMMUNICATION SYSTEMS CONTRACT DRAWINGS AND EIA/TIA REQUIREMENTS.
- 1) OUTLETS SHALL BE:
- a) WALL: 4 IN. SQUARE WITH REDUCER RING. COVER PLATE PROVIDED INTEGRAL WITH OUTLET DEVICE. BLANK OFF WHERE NO DEVICE IS INSTALLED.
- b) FLOOR: IN-FLOOR CAST IRON WITH LOW-TENSION FITTING OR AS SPECIFIED FOR POKE THRU FLOOR ASSEMBLIES.
- 2) CONDUIT FROM OUTLETS SHALL BE 1 IN. MINIMUM WHERE SIZE IS NOT SHOWN ON DRAWINGS. FURNISH EMPTY CONDUIT FROM OUTLETS TO NEAREST ACCESSIBLE HUNG CEILING OR AS NOTED. TERMINATE OPEN END WITH INSULATED BUSHING.
- C. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG AND AT ALL DROPS TO OUTLETS.
- D. PROVIDE RISER PULL BOXES AT A MINIMUM OF 50 FEET INTERVALS. FOR 2-INCH CONDUITS AND SMALLER. PROVIDE PULL BOX FOR EVERY 10 FEET FOR STRAIGHT RUNS. PROVIDE PULL BOX FOR EVERY 180 DEGREES OF BENDS. BENDING RADIUS SHALL NOT BE LESS THAN 10 TIMES INTERNAL CONDUIT DIAMETER.
- E. BOND ALL RACEWAYS SYSTEMS TO PROVIDE A COMMON GROUND PATH
- F. DEVICES, CONNECTORS AND WIRING COMPLETE WILL BE PROVIDED UNDER OTHER WORK SCOPES.
- G. FURNITURE SYSTEM CONNECTIONS FOR TEL/DATA SHALL BE A MINIMUM SIZE OF 2" UNLESS OTHERWISE NOTED ON DRAWINGS. FLOOR BOXES FOR TEL/DATA FURNITURE SYSTEM IN-FEEDS SHALL BE SEPARATE FROM POWER IN FEEDS.
19. INSTALLATION OF PRE-PURCHASED EQUIPMENT
- A. INSTALLER/CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS AS REQUIRED TO INSTALL PRE-PURCHASED EQUIPMENT.
20. FIRE ALARM SYSTEM
- A. REFER TO FIRE ALARM DRAWINGS. SYSTEM WIRING, DEVICES, ETC., SHALL BE IN ACCORDANCE WITH APPLICABLE CODE REQUIREMENTS, BUILDING STANDARDS AND SYSTEM MANUFACTURER. STROBE POWER SUPPLIES SHALL BE FURNISHED AND INSTALLED AS REQUIRED. SYSTEM RE-PROGRAMMING TO ACCOMMODATE DEMOLITION AND NEW DEVICES SHALL BE INCLUDED. ALL LABOR AND MATERIALS FOR SYSTEM PRE-TEST AND TEST WITH BUILDING VENDOR AND FIRE DEPARTMENT SHALL BE INCLUDED.
21. ELECTRICAL TESTING (CONTRACTOR TO FOLLOW APPLICABLE NETA STANDARDS).
- A. PROVIDE ALL NECESSARY METERS, INSTRUMENTS, TEMPORARY WIRING AND LABOR TO TEST AND ADJUST ALL EQUIPMENT AND WIRING INSTALLED AND/OR CONNECTED UNDER THIS CONTRACT, INCLUDING ELECTRICAL EQUIPMENT FURNISHED BY OTHERS, TO DETERMINE PROPER POLARITY, PHASING, FREEDOM FROM GROUND FAULTS AND SHORTS AND PROPER OPERATION OF EQUIPMENT. ALL MEASURING INSTRUMENTS MUST BE PROPERLY CALIBRATED.
- B. WHENEVER THE AUTHORITIES HAVING JURISDICTION REQUIRE THAT ANY WORK BE TESTED OR APPROVED, CONTRACTOR SHALL PROVIDE PROPER FACILITIES FOR ACCESS FOR INSPECTION.
- C. CHECK ALL LIGHTING FIXTURES AND RECEPTACLES FOR PROPER OPERATION.
- D. MOTORS:
- 1) MAKE THE FOLLOWING TESTS ON THE MOTORS BEFORE STARTING UP:
- a. CHECK MOTOR NAMEPLATE FOR HORSEPOWER, SPEED AND PHASE AND VOLTAGE.
- 2) MAKE THE FOLLOWING TESTS ON ALL MOTORS DURING OR IMMEDIATELY AFTER START UP:
- a. CHECK SHAFT ROTATION: CHECK BEARING TEMPERATURE: CHECK MOTOR FOR SMOOTH OPERATION.
- b. TAKE A CURRENT READING OF FULL LOAD USING A CLAMP ON AMMETER. IF AMMETER READING IS OVER THE RATED FULL LOAD CURRENT, DETERMINE THE REASON FOR THE DISCREPANCY AND TAKE THE NECESSARY CORRECTIVE ACTION.
- c. FOLLOWING ESTABLISHED PROCEDURES EQUIPMENT SHALL BE ENERGIZED AFTER CERTIFICATIONS BY THE CONTRACTOR THAT THE INSTALLATIONS SATISFACTORY. ALL MOTORS AND EQUIPMENT SHALL BE TESTED FOR PROPER OPERATION.
- d. OVERLOAD ELEMENTS IN MOTOR STARTERS SHALL BE ADJUSTED AND CHECKED FOR SUITABILITY TO THE MOTOR CHARACTERISTICS. CONTRACTOR SHALL REPLACE ANY OVERLOADING ELEMENT THAT IS INADEQUATE. THE CAUSE OF ANY MOTOR OPERATING ABOVE FULL LOAD RATING SHOULD BE INVESTIGATED AND THE CAUSE SHALL BE REMOVED INSTEAD OF INCREASING THE OVERLOAD RELAY TRIP RATING. THESE OPERATIONAL TESTS SHALL DETERMINE THAT THE INSTALLATION IS CORRECT.
- E. AFTER ALL ADJUSTMENTS ARE COMPLETE, TAKE CURRENT READINGS AT FULL LOAD USING A CLAMP ON AMMETER AND SUBMIT TO ENGINEERING FOR REVIEW AND APPROVAL.
- F. CHECK ALL CONDUCTORS FOR PROPER INSULATION RESISTANCE USING A MEGOHMMETER TEST SET IN ACCORDANCE WITH MANUFACTURERS STANDARD INSTRUCTIONS AND THE INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA). TEST INSULATION RESISTANCE OF ALL NEW AND AFFECTED EXISTING FEEDERS PRIOR TO ENERGIZING AND REPLACE ANY CONDUCTORS FOUND TO BE BELOW MANUFACTURERS ACCEPTABLE VALUES.
22. FIRE STOPPING
- A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.
- B. PROVIDE ALL REQUIRED FIRE-STOPPING. WORK INCLUDES FIRE STOPPING PENETRATIONS OF FIRE-RESISTANCE RATED FLOORS, WALLS AND PARTITIONS IN NEW CONSTRUCTION, AS WELL AS PRE-EXISTING PENETRATIONS IN RENOVATION AREAS OF EXISTING CONSTRUCTION.

- C. PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA FOR EACH FIRE-STOPPING PRODUCT REQUIRED, INCLUDING INSTRUCTIONS FOR SUBSTRATE PREPARATION AND FIRE-STOPPING INSTALLATION.
- D. FIRE RESISTANT JOINT SEALERS: PROVIDE MANUFACTURER'S STANDARD FIRE-STOPPING SEALANT WITH ACCESSORY MATERIALS, HAVING FIRE RESISTANCE RATINGS INDICATED AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES PER ASTM E814 BY UNDERWRITERS LABORATORY, INC. OR OTHER TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- E. MATERIALS - PROVIDE THE FOLLOWING:
- 1) ONE-PART FIRE-STOPPING SEALANT: ONE PART LATEX BASED INTUMESCENT SEALANT FORMULATED FOR USE IN A THROUGH-PENETRATION FIRE-STOP SYSTEM FOR SEALING OPENINGS AROUND CABLES, CONDUIT, PIPES AND SIMILAR PENETRATIONS THROUGH WALLS AND FLOORS. ACCEPTABLE PRODUCTS/MANUFACTURERS INCLUDE THE FOLLOWING:
- a) SPECIFIED TECHNOLOGIES INC. SPEC SEAL LC150
- b) HILTI FS-ONE MAX
23. DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS
- A. SUBMIT WRITTEN CERTIFICATION THAT ELECTRICAL SYSTEMS ARE COMPLETE AND OPERATIONAL. SUBMIT CERTIFICATION WITH CONTRACTOR'S REQUEST FOR FINAL REVIEW.
- 1) AT THE TIME OF FINAL REVIEW OF ELECTRICAL WORK, DEMONSTRATE THE OPERATION OF ELECTRICAL SYSTEMS. FURNISH LABOR, APPARATUS AND EQUIPMENT FOR SYSTEMS' DEMONSTRATION. THE VARIOUS TEST SHALL BE WITNESSED AND APPROVED BY THE OWNER AND/OR THE OWNERS REPRESENTATIVE.
- B. THE CONTRACTOR SHALL FURNISH ALL TEST EQUIPMENT, MATERIALS, LABOR, AND TEMPORARY POWER HOOK-UPS TO PERFORM START-UP AND ALL TESTS AS REQUIRED. ALL TEST PROCEDURES SHALL CONFORM TO THIS SPECIFICATION AND APPLICABLE STANDARDS INCLUDING BUT NOT LIMITED TO: ANSI, IEEE, NEMA, OSHA AND NETA.
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTS AND TEST RECORD. TESTING SHALL BE PERFORMED BY AND UNDER THE IMMEDIATE SUPERVISION OF THE CONTRACTOR. TEST RECORDS SHALL BE KEPT FOR EACH PIECE OF EQUIPMENT. COPIES SHALL BE FURNISHED TO THE ENGINEER FOR REVIEW AND/OR APPROVAL.
- D. A VISUAL INSPECTION OF ALL ELECTRICAL EQUIPMENT, TO CHECK FOR THE FOREIGN MATERIAL, TIGHTNESS OF WIRING AND CONNECTION, PROPER GROUNDING, MATCHING NAMEPLATE CHARTS WITH SPECIFICATION, ETC., SHALL BE MADE PRIOR TO ACTUAL TESTING.
- E. A COMPLETE OPERATIONAL TEST SHALL BE MADE ON THE REVISED LIFE SAFETY FIRE ALARM SYSTEM. THE CONTRACTOR SHALL CONSULT WITH THE EQUIPMENT VENDORS AND THEN SUBMIT FOR APPROVAL. A STEP-BY-STEP PROCEDURE DESCRIBING THE METHOD OF MAKING THE TESTS, THE EQUIPMENT TO BE UTILIZED AND THE FEATURE TO BE CHECKED BY THE TEST. ALL INTERLOCKS AND PROTECTIVE FEATURES SHALL BE CHECKED OUT.
24. DESIGN MODIFICATIONS
- A. THE DRAWINGS SHOW ELECTRICAL SYSTEMS THAT SUPPLY, CONTROL, AND/OR MONITOR SYSTEMS SPECIFIED ELSEWHERE. THE ELECTRICAL SYSTEM SHOWN HAS BEEN BASED ON SPECIFIC MANUFACTURER'S DATA OR INFORMATION CONVEYED TO THE ELECTRICAL DESIGNER. WHERE ANY AGREEMENT OR CHANGE IS MADE TO SUPPLY EQUIPMENT OF LARGER CAPACITY OR DIFFERENT ELECTRICAL CHARACTERISTICS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ELECTRICAL DESIGN MODIFICATIONS TO AFFECT SUCH CHANGES WITHIN THE INTENT OF THESE SPECIFICATIONS AND TO INFORM THE ENGINEER, IN WRITING, OF SUCH CHANGE. FOR EXAMPLE, IF HVAC COMPRESSORS AND/OR MOTORS ARE ALLOWED TO BE CHANGED TO 230 VOLTS RATHER THAN THE ORIGINALLY SPECIFIED 208 VOLTS, BOOSTING OR BUCKING TRANSFORMERS SHALL BE SUPPLIED, INSTALLED, AND WIRED TO ACCOMMODATE THE CHANGE AT NO ADDITIONAL COST.

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No.	Date	Description
REVISION		
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
ISSUE		
PROJECT		
Greenwich Public Schools		
WMS Auditorium AC Upgrade		
1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT		
DRAWING TITLE		
ELECTRICAL SPECIFICATIONS		
Drawn By	DA	Drawing No.
Checked By	FM	
Date	11/13/2020	E-501
Scale	NTS	
Project No.	190911-000	

GENERAL

- A. THE FOLLOWING NOTES APPLY TO ALL STRUCTURAL DRAWINGS. NOTES SHALL APPLY UNLESS OTHERWISE INDICATED BY STRUCTURAL DRAWINGS OR SPECIFICATIONS.
- B. WHERE A DETAIL, TYPICAL DETAIL, SECTION, TYPICAL SECTION OR PLAN NOTE IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL SIMILAR OR LIKE CONDITIONS UNLESS NOTED OTHERWISE.
- C. ALL DESIGN AND CONSTRUCTION IS BASED ON AND SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2015 EDITION, WITH APPLICABLE 2018 CT STATE BUILDING CODE AMENDMENTS. ALL REFERENCE STANDARDS SHALL BE OF THE EFFECTIVE DATE NOTED IN THE CONTROLLING BUILDING CODE.
- D. NO PROVISION OF ANY REFERENCED STANDARD SPECIFICATION, MANUAL OR CODE (WHETHER OR NOT SPECIFICALLY INCORPORATED BY REFERENCE IN THE CONSTRUCTION DOCUMENTS) SHALL BE EFFECTIVE TO CHANGE THE DUTIES AND RESPONSIBILITIES OF OWNER, CONTRACTOR, ENGINEER, SUPPLIER, OR ANY OF THEIR CONSULTANTS, AGENTS, OR EMPLOYEES FROM THOSE SET FORTH IN THE CONSTRUCTION DOCUMENTS. NOR SHALL IT BE EFFECTIVE TO ASSIGN TO THE STRUCTURAL ENGINEER OF RECORD OR ANY OF THE STRUCTURAL ENGINEER OF RECORD'S CONSULTANTS, AGENTS, OR EMPLOYEES ANY DUTY OR AUTHORITY TO SUPERVISE OR DIRECT THE FURNISHING OR PERFORMANCE OF THE WORK OR ANY DUTY OR AUTHORITY TO ACCEPT RESPONSIBILITIES CONTRARY TO THE PROVISIONS OF THE CONSTRUCTION DOCUMENTS.
- E. CONSTRUCTION DOCUMENTS INCLUDE, BUT ARE NOT LIMITED TO, THE STRUCTURAL DOCUMENTS (DRAWINGS AND SPECIFICATIONS), BUT DO NOT INCLUDE SHOP DRAWINGS, VENDOR DRAWINGS, OR MATERIAL PREPARED AND SUBMITTED BY THE GENERAL CONTRACTOR.
- F. CONSTRUCTION DOCUMENTS SHALL GOVERN IN THE EVENT OF A CONFLICT WITH THE CODE OF PRACTICE OR SPECIFICATIONS OF A.C.I., P.C.I., A.S.T.M., S.I. OR OTHER STANDARDS, WHERE A CONFLICT OCCURS WITHIN THE CONSTRUCTION DOCUMENTS, THE STRICTEST REQUIREMENT SHALL GOVERN.
- G. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS AND NOTIFY ARCHITECT/STRUCTURAL ENGINEER OF RECORD OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH WORK. FOR DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS, SEE ARCHITECTURAL DRAWINGS.
- H. DO NOT SCALE FOR DIMENSIONS NOT SHOWN ON DRAWINGS. SEND WRITTEN REQUEST FOR INFORMATION TO THE ARCHITECT FOR DIMENSIONS NOT PROVIDED.
- I. THE STRUCTURE SHOWN ON THESE DRAWINGS IS SELF-SUPPORTING ONLY IN ITS COMPLETED FORM. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE DESIGN, ADEQUACY, SAFETY, AND STABILITY OF TEMPORARY ERECTION BRACING AND SHORING.
- J. NO PROVISIONS HAVE BEEN MADE IN THE DESIGN FOR THE SUPPORT OF A CONCENTRATED LOAD FROM PLUMBING, MECHANICAL OR HVAC EXCEPT AS SHOWN ON THE DRAWINGS.
- K. THE GENERAL CONTRACTOR SHALL COORDINATE ALL SIZES AND LOCATIONS OF FLOOR, ROOF, AND WALL PENETRATIONS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS. ALL PENETRATIONS NOT SHOWN ON STRUCTURAL DRAWINGS MUST BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD UNLESS NOTED OTHERWISE.
- L. THE GENERAL CONTRACTOR SHALL VERIFY THAT MISCELLANEOUS FRAMING SHOWN ON THE STRUCTURAL DRAWINGS FOR MECHANICAL EQUIPMENT, OWNER-FURNISHED ITEMS, PARTITIONS, ETC. IS CONSISTENT WITH THE REQUIREMENTS OF SUCH ITEMS.
- M. ELEVATIONS SHOWN ARE TO TOP OF FOUNDATIONS, SLABS OR STEEL BEAMS UNLESS NOTED OTHERWISE.
- N. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ORDER TO COMPLY WITH THE CONSTRUCTION DOCUMENTS.
- O. THE GENERAL CONTRACTOR HAS SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE OSHA REGULATIONS.
- P. THE STRUCTURAL ENGINEER OF RECORD HAS DELEGATED THE DESIGN OF PRECAST CONCRETE, GLAZING SYSTEMS, COLD FORMED METAL FRAMING, RAILING, SKYLIGHTS, AND STAIRS, OR OTHER SYSTEMS NOT SHOWN IN THE STRUCTURAL DRAWINGS. SUCH SYSTEMS SHALL BE DESIGNED, FURNISHED, AND INSTALLED AS REQUIRED BY OTHER PORTIONS OF THE CONTRACT DOCUMENTS.
- Q. ALL TESTING SHALL BE PAID FOR BY THE OWNER. CONTRACTOR SHALL COORDINATE WITH OWNER TO ENSURE THAT AT COST OF TESTING IS ACCURATE AND PRESENTED TO OWNER WITH CONSTRUCTION COSTS).

SHOP DRAWINGS

- A. STRUCTURAL DRAWINGS INDICATE TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. SHOP DRAWINGS SHALL DETAIL ALL CONDITIONS IN ACCORDANCE WITH SPECIFIED STANDARDS AND THE SPECIFIC REQUIREMENTS OF THIS PROJECT AS INDICATED IN THE CONSTRUCTION DOCUMENTS.
- B. THE GENERAL CONTRACTOR SHALL SUBMIT, AS REQUIRED, PRINTS OR ELECTRONIC COPIES, AS DIRECTED, OF SHOP DRAWINGS FOR ALL FABRICATED MATERIALS TO ARCHITECT FOR REVIEW.
- C. REVIEW OF SHOP DRAWINGS BY THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD DOES NOT RELIEVE THE GENERAL CONTRACTOR OF THE SOLE RESPONSIBILITY FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF THOSE SHOP DRAWINGS.
- D. SHOP DRAWINGS AND CALCULATIONS FOR DELEGATED DESIGN ITEMS AS DICTATED BY THE CONSTRUCTION DOCUMENTS SHALL BE SIGNED AND SEALED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED BEFORE SUBMITTING FOR REVIEW BY THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- E. COMPLETE SHOP DRAWINGS FOR CONSTRUCTION OF ALL APPLICABLE SPECIALTY ITEMS INCLUDING, BUT NOT LIMITED TO PRECAST CONCRETE, GLAZING SYSTEMS, COLD FORMED METAL FRAMING, RAILING, SKYLIGHTS, AND STAIRS SHALL BE SIGNED AND SEALED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, AND SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.
- F. REPRODUCTION/REPLICATION OF THE STRUCTURAL DRAWINGS FOR USE IN THE PRODUCTION OF SHOP DRAWINGS IS PROHIBITED, UNLESS NOTED OTHERWISE. IN THE EVENT THAT THE GENERAL CONTRACTOR OR SUBCONTRACTOR ELECTS TO PRODUCE SHOP DRAWINGS BY COPYING ELECTRONIC OR OTHER COPIES OF THE STRUCTURAL DRAWINGS, THE CONTRACTOR SHALL REQUEST FROM THE STRUCTURAL ENGINEER OF RECORD A SHOP DRAWING WAIVER ALONGS WITH THE SPECIFIC SHEETS REQUIRED. SIGNATURE OF THE WAIVER BY THE GENERAL CONTRACTOR, ALONG WITH PAYMENT OF A FEE TO THE STRUCTURAL ENGINEER OF RECORD WILL BE REQUIRED. THE GENERAL CONTRACTOR SHALL CONTINUE TO ASSUME RESPONSIBILITY FOR ERRORS, OMISSIONS AND COORDINATION REQUIRED FOR SHOP DRAWING PRODUCTION, REGARDLESS OF THE USE OF COPIES OF THE STRUCTURAL DRAWINGS FOR SHOP DRAWING PRODUCTION.

EXISTING CONDITIONS

- A. THE GENERAL CONTRACTOR SHALL SURVEY THE EXISTING STRUCTURE TO DETERMINE THAT ALL MODIFICATIONS AS INDICATED IN THE CONSTRUCTION DOCUMENTS ARE FEASIBLE AND PRACTICAL AND SHALL REPORT ANY DISCREPANCIES OR UNUSUAL CONDITIONS TO THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- B. WHEN EXISTING FRAMING IS SHOWN ON THE STRUCTURAL DRAWINGS IT IS FOR REFERENCE ONLY AS IT RELATES TO THE STRUCTURE. THE SCOPE OF WORK, THE STRUCTURAL DRAWINGS ARE NOT INTENDED TO BE A COMPREHENSIVE REPRESENTATION OF THE AS-BUILT EXISTING STRUCTURE.
- C. WHERE PORTIONS OF THE NEW CONSTRUCTION ARE INDICATED TO FIT TO EXISTING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL VERIFY DIMENSIONS OF EXISTING CONSTRUCTION BY FIELD MEASUREMENTS BEFORE SUBMISSION OF SHOP DRAWINGS AND FABRICATION.
- D. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES IN THE AREA OF CONSTRUCTION THAT MIGHT BE AFFECTED BY OR OTHERWISE INTERFERE WITH INSTALLATION OF NEW WORK. THIS INCLUDES THOSE THAT MIGHT BE DAMAGED BY NEW FOUNDATION OR OTHER WORK, AND THOSE WHOSE PRESENCE MIGHT LEAD TO DAMAGE TO THE NEW WORK (SUCH AS DIFFERENTIAL SETTLEMENT, ETC.).

DESIGN LOADS

- A. DESIGN ROOF DEAD LOAD:
1. SELF WEIGHT OF STRUCTURE + 10 PSF (ASSUMED)
- B. DESIGN ROOF LIVE LOAD:
1. 20 PSF
2. MECHANICAL UNIT (SEE PLAN FOR WEIGHT)
3. REDUCTIONS APPLIED PER TRIBUTARY AREA AS PERMITTED BY CODE
- C. DESIGN SNOW LOAD:
1. GROUND SNOW LOAD, $P_g = 30$ PSF
2. FLAT ROOF SNOW LOAD, $P_f = 23.1$ PSF (USED FOR DRIFT & UNBALANCED LOADING)
3. MINIMUM ROOF SNOW LOAD, $P_m = 30$ PSF (PER CT STATE BUILDING CODE)
4. SNOW EXPOSURE FACTOR, $C_e = 1.0$
5. SNOW IMPORTANCE FACTOR, $I_s = 1.1$
6. SNOW THERMAL FACTOR, $C_t = 1.0$
- D. DESIGN WIND LOAD:
1. ULTIMATE DESIGN WIND SPEED, $V_{ult} = 130$ MPH
2. NOMINAL DESIGN WIND SPEED $V_{asd} = 101$ MPH
3. RISK CATEGORY: III
4. WIND EXPOSURE CATEGORY: B
5. COMPONENTS AND CLADDING WIND PRESSURE: 50 PSF (H2), 39 PSF (UPLIFT)
6. INTERNAL PRESSURE COEFFICIENT (C_{pi}): +/- 0.18
- E. DESIGN SEISMIC INFORMATION:
1. RISK CATEGORY: III
2. MAPPED SPECTRAL RESPONSE COEFFICIENT, $S_s = 0.259$
3. MAPPED SPECTRAL RESPONSE COEFFICIENT, $S_1 = 0.070$
4. SPECTRAL RESPONSE COEFFICIENT, $S_{ds} = 0.275$
5. SPECTRAL RESPONSE COEFFICIENT, $S_{d1} = 0.112$
6. SITE CLASS: D (ASSUMED)
7. BASE SEISMIC-FORCE RESISTING SYSTEM: OTHER MECHANICAL OR ELECTRICAL COMPONENTS
8. DESIGN SEISMIC FORCE: 0.9 K
9. ANALYSIS PROCEDURE: NONSTRUCTURAL COMPONENTS (ASCE 7, SECTION 13.6)
10. RESPONSE MODIFICATION FACTOR, $R_p = 1.5$
11. COMPONENT AMPLIFICATION FACTOR, $a_p = 1.0$
12. SEISMIC DESIGN CATEGORY: B
13. SEISMIC IMPORTANCE FACTOR, $I_e = 1.25$
- F. NO PROVISIONS HAVE BEEN MADE FOR FUTURE HORIZONTAL OR VERTICAL EXPANSION.

SUSPENDED LOADS AT STRUCTURE

- A. ATTACHMENT TO ROOF DECK FOR ANY SUSPENDED LOADS IS PROHIBITED WITHOUT WRITTEN APPROVAL FROM ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- B. PIPE HANGERS SHALL BE ATTACHED TO BOTTOM FLANGES OF JOISTS OR BEAMS WITH APPROVED CLAMPS/CONNECTIONS.
- C. ALL MULTIPLE TIER CABLE TRAYS, PIPE RACKS OR GROUPS OF PIPES OR DUCTS SHALL BE SUPPORTED FROM EACH ROOF FRAMING MEMBER WHERE THE GROUP CROSSES THE MEMBER OR AT 8'-0" O.C. MAX. WHERE GROUP IS ORIENTED PARALLEL TO THE MEMBER, UNLESS NOTED OTHERWISE ON DRAWINGS.
- D. HANGERS SHALL BE ADDED AT ALL PIPE VALVE AND FITTING LOCATIONS.
- E. CONTRACTORS AND SUBCONTRACTORS SUSPENDING LOADS FROM STRUCTURE SHALL ACCOUNT FOR AND PROVIDE ALL CONNECTIONS, STRUTS, TIES AND RIGGING REQUIRED FOR COMPLETE INSTALLATION AND SHALL FURNISH DRAWINGS SHOWING POINTS OF SUPPORT, SUPPORT LOADS AND ALL REQUIRED SUPPLEMENTAL BRACING, PROVIDE SUPPORTS AND HANGERS AS REQUIRED FOR PIPING AND EQUIPMENT SO THAT ALL COMBINED LOADING SHALL NOT EXCEED ALLOWABLE LOADINGS OF STRUCTURE AS SHOWN ON STRUCTURAL DRAWINGS. SUPPORT LOCATIONS SHALL BE COORDINATED WITH OTHER TRADES AND SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATIONS OF THE ITEMS SUPPORTED.
- F. EXPENSE RESULTING FROM IMPROPER COORDINATION OR LOCATION OF ANCHOR BOLTS, OPENINGS, SLEEVES, INSERTS, HANGERS OR OTHER SUPPORTS REQUIRED FOR PIPING AND EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

WELDING

- A. MINIMUM WELD SIZE SHALL BE 3/16" FILLET WELD UNLESS NOTED OTHERWISE.
- B. WELD FILLER METALS SHALL COMPLY WITH AWS REQUIREMENTS FOR THE APPLICABLE WELD PROCESS AND BASE MATERIAL, AND AS FOLLOWS:
1. USE 70 KSI (E70XX) MINIMUM ELECTRODES UNLESS NOTED OTHERWISE.
2. USE 80 KSI (E80XX) ELECTRODES FOR WELDING AT COLD FORMED STEEL FRAMING, AND FOR PUDDLE WELDS OF COMPOSITE DECK, ROOF DECK AND NON-COMPOSITE DECK TO SUPPORTS WHEN DECK THICKNESS IS 22 GAGE OR GREATER.
3. USE 70 KSI (E70XX) ELECTRODES FOR PUDDLE WELDS OF COMPOSITE DECK, ROOF DECK AND NON-COMPOSITE DECK TO SUPPORTS WHEN DECK THICKNESS IS LESS THAN 22 GAGE AND WELDS ARE MADE THROUGH WELD WASHERS.
- C. FIELD WELDING SHALL BE SHOWN ON SHOP DRAWINGS AND ERECTION DRAWINGS.
- D. REFER TO ARCHITECTURAL DOCUMENTS FOR EXPOSED STEEL AND JOINT LOCATIONS AND REQUIREMENTS. ALL EXPOSED WELDED CONNECTIONS SHALL BE GROUND SMOOTH AND SUBJECT TO ARCHITECT APPROVAL. FABRICATOR SHALL ALTER JOINT DETAILING AS REQUIRED TO ENSURE THAT EFFECTIVE WELD THROAT SPECIFIED IN WELD DETAIL IS MAINTAINED AFTER GRINDING OF WELD SURFACE.
- E. WELDS INDICATED IN STRUCTURAL DETAILS ARE INTENDED AS THE BASIS OF DESIGN. FABRICATOR AND ERECTOR HAVE THE OPTION TO PROPOSE THE USE OF ALTERNATIVE WELDING PROCEDURES. ALTERNATIVE WELDS SHALL BE INDICATED ON SHOP DRAWINGS FOR REVIEW BY THE STRUCTURAL ENGINEER OF RECORD.
- F. REINFORCING STEEL WELDING SHALL CONFORM TO AWS D1.4, STRUCTURAL WELDING CODE - REINFORCING STEEL BY AMERICAN WELDING SOCIETY FOR COMPLIANCE WITH AISC 318, SECTION 3.5.2.
- G. ALL WELDED CONNECTIONS SHALL COMPLY WITH AWS D1.1 FOR TOLERANCES, APPEARANCES, WELDING PROCEDURE SPECIFICATIONS, WELD QUALITY, AND METHODS USED IN CORRECTING WELDING WORK.
- H. COMPLY WITH AISC 303 AND AISC 360 FOR BEARING, ALIGNMENT, ADEQUACY OF TEMPORARY CONNECTIONS, AND REMOVAL OF PAINT ON SURFACES ADJACENT TO FIELD WELDS.
- I. REMOVE BACKING BARS OR RUNOFF TABS, BACK GOUGE, AND GRIND STEEL SMOOTH.

HOT-DIP GALVANIZED STRUCTURAL STEEL

- A. ALL HOT-DIP GALVANIZING WORK SHALL BE IN ACCORDANCE WITH ASTM A-123.
- B. ALL BOLTS USED FOR CONNECTIONS AT GALVANIZED STEEL MEMBERS SHALL BE GALVANIZED PER STANDARDS NOTED.
- C. REFER TO ASTM A-143, A-384 AND D-6386 FOR ADDITIONAL STANDARD PRACTICES RELATED TO SPECIAL CONDITIONS FOR HOT-DIP GALVANIZING.
- D. GALVANIZED PAINTING SURFACES AT SLIP CRITICAL CONNECTIONS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A-123 AND SHALL BE ROUGHENED BY MEANS OF HAND WIRE BRUSHING. POWER WIRE BRUSHING IS NOT PERMITTED.
- E. ALL STEEL EXPOSED TO EARTH OR WEATHER SHALL BE GALVANIZED (INCLUDING EXPOSED LINTEL ANGLES).
- F. DAMAGED AREAS, BARE SPOTS, WELDS & FIELD CONNECTIONS SHALL BE TOUCH-UP GALVANIZED PER METHODS STIPULATED IN ASTM A-780.

STRUCTURAL STEEL

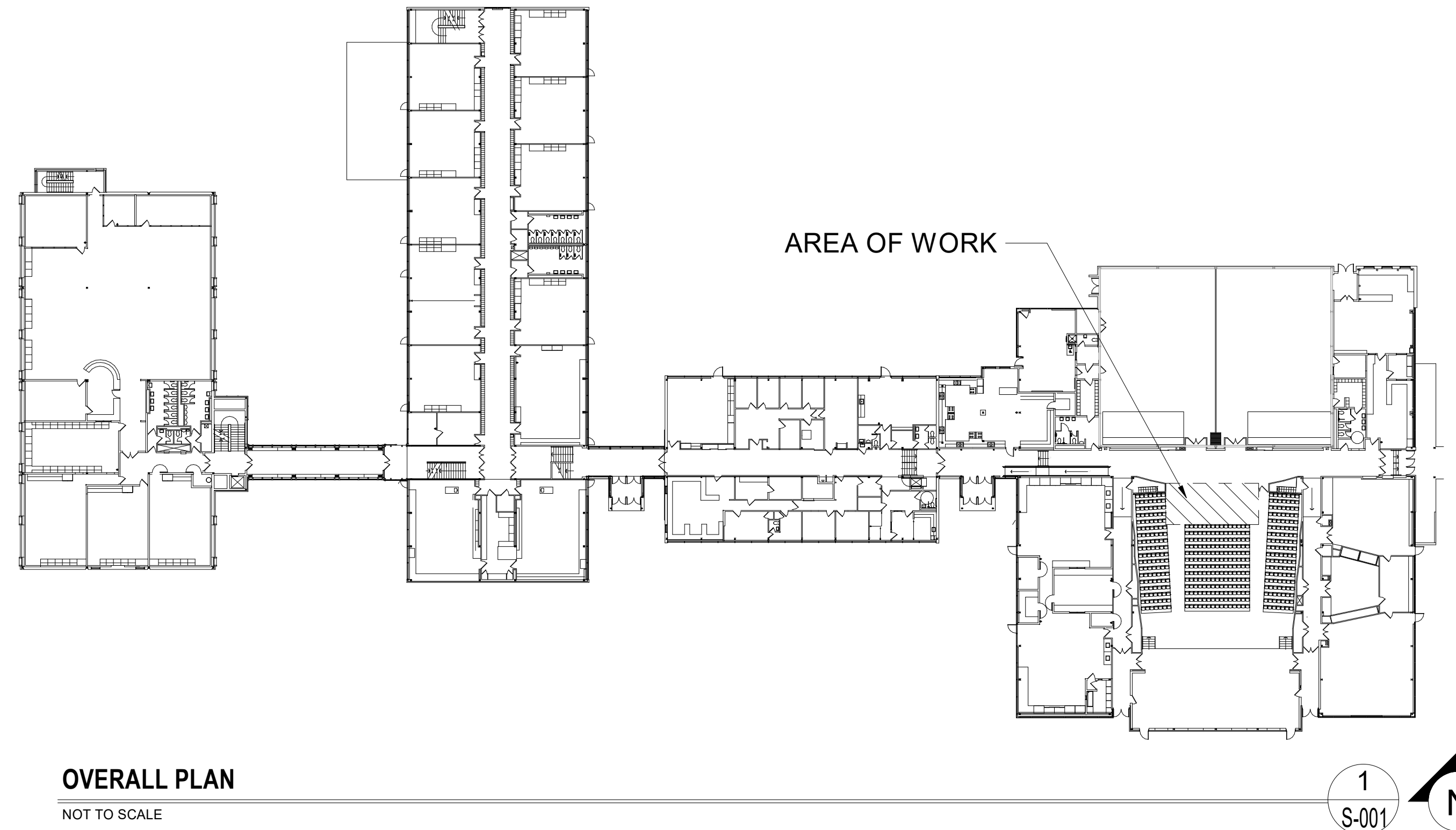
- A. ALL STRUCTURAL STEEL DESIGN AND CONSTRUCTION SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, AISC 360, & AISC SEISMIC PROVISIONS FOR STEEL BUILDINGS, AISC 341 (IF SEISMIC DETAILING IS REQUIRED).
- B. GUSSET PLATES AND STIFFENER PLATES SHALL BE 3/8" MINIMUM, WELDED BOTH SIDES CONTINUOUSLY, UNLESS NOTED OTHERWISE.
- C. POWDER ACTUATED FASTENERS (OR POWDER DRIVEN FASTENERS) SHALL BE ANCHORED IN STEEL WITH MINIMUM FASTENER SPACING OF 1 1/2" AND MINIMUM EDGE DISTANCE OF 1/2".
- D. MATERIALS:
1. W-SHAPES: ASTM A 992.
2. CHANNELS, ANGLES, M-SHAPES: ASTM A 36.
3. PLATE AND BAR: ASTM A 36.
4. COLD-FORMED HOLLOW STRUCTURAL SECTIONS: ASTM A 500, GRADE C, STRUCTURAL TUBING.
5. STEEL PIPE: ASTM A 53, TYPE E OR S, GRADE B.
6. HIGH-STRENGTH BOLTS, NUTS, AND WASHERS: ASTM A 325, TYPE 1 OR ASTM A 490 TYPE 1 HEAVY HEX STEEL STRUCTURAL BOLTS ASTM A 563, GRADE DH, HEAVY HEX CARBON-STEEL NUTS, AND ASTM F 436, TYPE 1, HARDENED CARBON-STEEL WASHERS WITH PLAIN FINISH.
7. UNHEADED ANCHOR RODS: ASTM F 1554, GRADE 36. CONFIGURATION TO BE STRAIGHT.
9. PLATE WASHERS: ASTM A 36 CARBON STEEL.
10. WASHERS: ASTM F 436, TYPE 1, HARDENED CARBON STEEL.
11. THREADED RODS: ASTM A 36.
- E. CONNECTIONS:
1. WHERE COMPLETE CONNECTION DESIGN IS NOT INDICATED IN THE STRUCTURAL DRAWINGS, CONNECTIONS SHALL BE COMPLETED BY THE STRUCTURAL STEEL FABRICATOR IN ACCORDANCE WITH DIVISION 05 PERFORMANCE SPECIFICATION REQUIREMENTS.
2. CONNECTIONS SHALL BE DESIGNED AS SNUG-TIGHT CONNECTIONS WITH THREADS IN THE SHEAR PLANE, UNLESS NOTED OTHERWISE. ALL BOLTS NOTED AS PRE-TENSIONED OR SLIP CRITICAL IN THE DRAWINGS SHALL BE TIGHTENED TO THE MINIMUM PRETENSION VALUE SHOWN IN TABLE J3.1 OF THE AISC STEEL MANUAL, USING COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATOR DEVICES CONFORMING TO ASTM F959 OR TENSION-CONTROL, HIGH STRENGTH BOLT-NUT-WASHER ASSEMBLIES CONFORMING TO ASTM 1852.
- F. CONNECTION PERFORMANCE REQUIREMENTS: PROVIDE DETAILS OF THE FOLLOWING CONNECTIONS REQUIRED BY THE CONSTRUCTION DOCUMENTS TO BE SELECTED OR COMPLETED BY STRUCTURAL-STEEL FABRICATOR, INCLUDING COMPREHENSIVE ENGINEERING DESIGN BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, TO WITHSTAND LOADS INDICATED AND COMPLY WITH OTHER INFORMATION AND RESTRICTIONS INDICATED.
1. SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE SELECTED OR COMPLETED BY AN EXPERIENCED STEEL DETAILER. TABLES IN THE AISC STEEL CONSTRUCTION MANUAL SHALL BE USED.
2. CONNECTIONS OTHER THAN SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED WORKING FOR THE FABRICATOR.
3. USE ASD, DATA ARE GIVEN AT SERVICE-LOAD LEVEL.
4. WHERE BEAM SHEAR IS NOT NOTED, THE CONNECTIONS SHALL DEVELOP THE BEAM SHEAR V + $W/2$ WHERE W IS THE TOTAL ALLOWABLE BEAM UNIFORM LOAD BASED ON LATERALLY SUPPORTED SIMPLE SPAN MOMENTS PER TABLES LOCATED IN THE AISC STEEL CONSTRUCTION MANUAL.
- G. CONNECTION SUBMITTAL REQUIREMENTS:
1. SIMPLE SHEAR CONNECTIONS: INCLUDE SUBSTANTIATING CONNECTION INFORMATION DOCUMENTING THE SHEAR CAPACITY OF A MINIMUM OF (3) REPRESENTATIVE CONNECTION TYPES ON THE PROJECT.
2. CONNECTIONS OTHER THAN SIMPLE SHEAR CONNECTIONS: INCLUDE CALCULATIONS SIGNED AND SEALED BY THE REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, WHO IS RESPONSIBLE FOR THEIR PREPARATION. ADDITIONALLY, THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OF THE CONNECTION DESIGN SHALL REVIEW AND CONFIRM IN WRITING THAT THE APPROVAL DOCUMENTS PROPERLY INCORPORATE THE CONNECTION DETAILS.
- H. PREPARE SHOP DRAWINGS SHOWING FABRICATION OF STRUCTURAL-STEEL COMPONENTS, INCLUDE DETAILS OF CUTS, CONNECTIONS, SPLICES, CAMBER, HOLES, AND OTHER PERTINENT DATA. INCLUDE EMBEDMENT DRAWINGS. INDICATE WELDS BY STANDARD AWS SYMBOLS.
- I. DISTINGUISHING BETWEEN SHOP AND FIELD WELDS, AND SHOW SIZE, LENGTH, AND TYPE OF EACH WELD. SHOW BACKING BARS THAT ARE TO BE REMOVED AND SUPPLEMENTAL FILLET WELDS WHERE BACKING BARS ARE TO REMAIN. INDICATE TYPE, SIZE, AND LENGTH OF BOLTS, DISTINGUISHING BETWEEN SHOP AND FIELD BOLTS. IDENTIFY PRETENSIONED AND SLIP-CRITICAL HIGH-STRENGTH BOLTED CONNECTIONS.
- J. STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION. KEEP STEEL MEMBERS OFF GROUND AND SPACED BY USING PALLETS, DUNNAGE, OR OTHER SUPPORTS AND SPACERS. PROTECT STEEL MEMBERS AND PACKAGED MATERIALS FROM CORROSION AND DETERIORATION.
- K. FABRICATE AND ASSEMBLE STRUCTURAL STEEL IN SHOP TO GREATEST EXTENT POSSIBLE. FABRICATE ACCORDING TO AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" AND AISC 360.
- L. PROVIDE HOLES REQUIRED FOR SECURING OTHER WORK TO STRUCTURAL STEEL. PROVIDE HOLES FOR OTHER WORK TO PASS THROUGH STEEL FRAMING MEMBERS ONLY AS SHOWN IN STRUCTURAL CONSTRUCTION DRAWINGS. CUT, DRILL, OR PUNCH HOLES PERPENDICULAR TO STEEL SURFACES. DO NOT THERMALLY CUT BOLT HOLES OR ENLARGE HOLES BY BURNING. BASEPLATE HOLES: CUT, DRILL, OR PUNCH HOLES PERPENDICULAR TO STEEL SURFACES.
- M. HIGH-STRENGTH BOLTS: INSTALL HIGH-STRENGTH BOLTS ACCORDING TO RCSC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS" FOR TYPE OF BOLT AND TYPE OF JOINT SPECIFIED. BOLTED CONNECTIONS SHALL BE SNUG TIGHTENED UNLESS NOTED OTHERWISE.
- N. PROVIDE TEMPORARY SHORES, GUYS, BRACES, AND OTHER SUPPORTS DURING ERECTION TO KEEP STRUCTURAL STEEL SECURE, PLUMB, AND IN ALIGNMENT AGAINST TEMPORARY CONSTRUCTION LOADS AND LOADS EQUAL IN INTENSITY TO DESIGN LOADS. REMOVE TEMPORARY SUPPORTS WHEN PERMANENT STRUCTURAL STEEL CONNECTIONS, BRACING, AND DIAPHRAGMS ARE IN PLACE UNLESS OTHERWISE INDICATED.
- O. SET STRUCTURAL STEEL ACCURATELY IN LOCATIONS AND TO ELEVATIONS INDICATED AND ACCORDING TO AISC 303 AND AISC 360.
- P. MAINTAIN ERECTION TOLERANCES OF STRUCTURAL STEEL WITHIN AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
- Q. ALIGN AND ADJUST VARIOUS MEMBERS THAT FORM PART OF COMPLETE FRAME OR STRUCTURE BEFORE PERMANENTLY FASTENING. BEFORE ASSEMBLY, CLEAN BEARING SURFACES AND OTHER SURFACES THAT WILL BE IN PERMANENT CONTACT WITH MEMBERS. PERFORM NECESSARY ADJUSTMENTS TO COMPENSATE FOR DISCREPANCIES IN ELEVATIONS AND ALIGNMENT. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF STRUCTURE. MAKE ALLOWANCES FOR DIFFERENCE BETWEEN TEMPERATURE AT TIME OF ERECTION AND MEAN TEMPERATURE WHEN STRUCTURE IS COMPLETED AND IN SERVICE.
- R. DO NOT USE THERMAL CUTTING DURING ERECTION.
- S. DO NOT ENLARGE UNFAIR HOLES IN MEMBERS BY BURNING OR USING DRIFT PINS. REAM HOLES THAT MUST BE ENLARGED TO ADMIT BOLTS.

ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	K	KIPS (KILOPOUNDS)
ADDL	ADDITIONAL	KLF	KIPS PER LINEAL FOOT
AESS	ARCHITECTURAL EXPOSED	KSI	KIPS PER SQUARE INCH
	STRUCTURAL STEEL	KSF	KIPS PER SQUARE FOOT
AFB	ABOVE FINISHED FLOOR	KSF	KIPS PER SQUARE FOOT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	L	LENGTH
AIISI	AMERICAN IRON AND STEEL INSTITUTE	LFH	LONG FACE HORIZONTAL
ALTN	ALTERNATE	LFV	LONG FACE VERTICAL
AR	ANCHOR ROD	LG	LONG
ARCH	ARCHITECT	LL	LIVE LOAD
ASD	ALLOWABLE STRESS DESIGN	LLH	LONG LEG HORIZONTAL
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS	LLV	LONG LEG VERTICAL
		LO	LOW
		LOCs	LOCATIONS
		LRFD	LOAD RESISTANCE FACTORED DESIGN
AWS	AMERICAN WELDING SOCIETY	LSH	LONG SIDE HORIZONTAL
B/	BOTTOM OF	LSV	LONG SIDE VERTICAL
BD	BOARD	LW	LONG WAY
BTW	BETWEEN	LWC	LIGHT WEIGHT CONCRETE
BLDG	BUILDING	LWC	LIGHT WEIGHT CONCRETE
BM	BEAM	MAX	MAXIMUM
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL & PLUMBING
BP	BASE PLATE	MEZZ	MEZZANINE
BRDG	BRIDGING	MFR	MANUFACTURER
BRG	BEARING	MIN	MINIMUM
CC	CENTER-TO-CENTER	MISC	MISCELLANEOUS
CFSF	COLD FORMED STEEL FRAMING	MPJI	MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS
CJ	CONTROL JOINT	MTL	METAL
CL	CENTERLINE	NIC	NOT IN CONTRACT
CLR	CLEAR	NS	NEAR SIDE
CMU	CONCRETE MASONRY UNIT	NTS	NOT TO SCALE
COL	COLUMN	OC	ON CENTER
CONC	CONCRETE	OD	OUTSIDE DIAMETER
CONV	CONNECTION	OH	OPPOSITE HAND
CONT	CONTINUOUS	OPNG	OPENING
CTR	CENTER	PAF	POWDER ACTUATED FASTENERS
D&E	DRILL & EPOXY	PEMB	PRE-ENGINEERED METAL BUILDING
D	DEEP	PJF	PREFORMED JOINT FILLER
DBA	DEFORMED BAR ANCHOR	PL	PLATE
DBL	DOUBLE	PLF	POUNDS PER LINEAL FOOT
DEP	DEPRESTED	PPHCC	PRESTRESSED PRECAST HOLLOW CORE CONCRETE
DIA	DIAMETER	PREFAB	PRE-FABRICATED
DIA	DIAGONAL	PSI	POUNDS PER SQUARE INCH
DL	DEAD LOAD	PSF	POUNDS PER SQUARE FOOT
DWL	DOWEL	PT	POST TENSIONED
DN	DOWN	P.T.	PRESSURE TREATED
EA	EACH	QTY	QUANTITY
EF	EACH FACE	RAD	RADIUS
EJ	EXPANSION JOINT	RD	ROOF DRAIN
ELEV	ELEVATION	REF	REFERENCE
ENG	ENGINEER OR ENGINEERING	REINF	REINFORCING
EOS	EDGE OF SLAB	REQD	REQUIRED
EQ	EQUAL	REV	REVISION
EW	EACH WAY	RTU	ROOF TOP UNIT
EXIST	EXISTING	SCHED	SCHEDULE
EXP	EXPANSION	SER	STRUCTURAL ENGINEER OF RECORD
EXT	EXTERIOR	SF	SQUARE FOOT
F/	FACE OF	SHTHG	SHEATHING
FD	FLOOR DRAIN	SIM	SIMILAR
FDN	FOUNDATION	SLH	SHORT LEG HORIZONTAL
FF	FINISH FLOOR	SLV	SHORT LEG VERTICAL
FR	FLOOR	SPA	SPACES
FRT	FIRE RETARDANT TIMBER	SPEC	SPECIFICATION
FS	FAR SIDE	SS	STAINLESS STEEL
FV	FIELD VERIFY	STD	STANDARD
GA	GAUGE, GAGE	STIFF	STIFFENER
GALV	GALVANIZED	STL	STEEL
GC	GENERAL CONTRACTOR	SW	SHORT WAY
GDR	GIRDER	SYM	SYMMETRICAL
GENL	GENERAL	T/	TOP OF
GYP	GYPSON	T&B	TOP & BOTTOM
HCA	HEADED CONCRETE ANCHORS	T&G	TONGUE & GROOVE
HDR	HEADER	TEMP	TEMPORARY
HG	HIP GIRDER	TG	TRUSS GIRDER
HGR	HANGER	THK	THICKENED or THICK
HI	HIGH	THRU	THROUGH
HKD	HOKED	TYP	TYPICAL
HORIZ	HORIZONTAL	UNO	UNLESS NOTED OTHERWISE
HSS	HOLLOW STRUCTURAL SECTION	VERT	VERTICAL
H.T.	HEAVY TIMBER	W	WIDE
ID	INSIDE DIAMETER	W/	WITH
IE	INVERT ELEVATION	W/O	WITHOUT
INSUL	INSULATION OR INSULATING	WO	WOOD
INT	INTERIOR	WP	WORK POINT
JST	JOIST	WWR	WELDED WIRE REINFORCEMENT
JT	JOINT		

STRUCTURAL SHEET LIST

S-001	GENERAL NOTES & SCHEDULES
S-002	SPECIAL INSPECTIONS
S-100	PARTIAL ROOF FRAMING PLAN



OVERALL PLAN

NOT TO SCALE

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11/13/2020

No.	Date	Description
REVISION		
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
ISSUE		

PROJECT
Greenwich Public Schools
WMS Auditorium AC Upgrade
1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING
TITLE

GENERAL NOTES & SCHEDULES

Drawn By	TJL	Drawing No.	
Checked By	DPA		
Date	11/13/2020		
Scale	As indicated		
Project No.	190911-000		

S-001

SPECIAL INSPECTIONS

- A. SPECIAL INSPECTIONS ARE REQUIRED IN ADDITION TO THE INSPECTIONS SPECIFIED IN SECTION 110 OF THE BUILDING CODE.
- B. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED UNDER SECTION 1705 OF THE BUILDING CODE. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO MEETS APPLICABLE REQUIREMENTS FOR SPECIAL INSPECTORS. TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
- C. SPECIAL INSPECTION AND TESTING SERVICES ARE REQUIRED TO PROVIDE A DETAILED VERIFICATION OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS, CODES AND STANDARDS SPECIFIED. SPECIAL INSPECTION SERVICES AND THE PRESENCE OF SPECIAL INSPECTORS ON SITE DO NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENT REQUIREMENTS.
- D. ALL SPECIAL INSPECTIONS ON THIS PROJECT SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS AND THE APPLICABLE BUILDING CODE INCLUDING REFERENCED STANDARDS. IN ADDITION TO THIS DOCUMENT, THE SPECIAL INSPECTIONS SCHEDULE HAS BEEN SUBMITTED AS PART OF THE CONSTRUCTION DOCUMENTS. THESE DOCUMENTS DESCRIBE CONTRACTOR RESPONSIBILITIES, FABRICATOR RESPONSIBILITIES, REQUIRED INSPECTIONS/TESTING AND INSPECTION/TESTING FREQUENCY.
- E. HOLD A SPECIAL INSPECTIONS PRECONSTRUCTION MEETING AT LEAST 7 DAYS PRIOR TO INITIAL PLANNED DATE FOR START OF WORK REQUIRING SPECIAL INSPECTIONS. DISCUSSIONS SHALL INCLUDE THE REVIEW OF SPECIFICATIONS AND SCHEDULE OF SPECIAL INSPECTIONS FOR WORK REQUIRING SPECIAL INSPECTIONS. THE RESPONSIBILITIES OF CONTRACTOR, OWNER, TESTING AGENCY, SPECIAL INSPECTOR, AND REGISTERED DESIGN PROFESSIONAL, AND THE NOTIFICATION AND REPORTING PROCEDURES.
- F. SPECIAL INSPECTIONS SHALL BE PERFORMED BY AGENTS WHO HAVE RELEVANT EXPERIENCE FOR EACH CATEGORY OF INSPECTIONS. MINIMUM QUALIFICATIONS AND CERTIFICATIONS FOR EACH CATEGORY ARE INDICATED IN THE BUILDING CODE.
- G. SPECIAL TESTING AND INSPECTIONS: OWNER WILL ENGAGE AN AGENCY TO CONDUCT SPECIAL INSPECTIONS AND TESTING AS DESCRIBED IN THE REFERENCED SPECIAL INSPECTIONS DOCUMENTATION AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
1. SPECIAL INSPECTOR AND HIS AGENTS WILL NOTIFY REGISTERED DESIGN PROFESSIONAL AND CONTRACTOR OF DEFICIENCIES OBSERVED IN THE WORK.
2. SPECIAL INSPECTOR AND HIS AGENTS WILL SUBMIT A CERTIFIED WRITTEN REPORT OF EACH TEST, INSPECTION AND SIMILAR QUALITY-CONTROL SERVICE.
3. SPECIAL INSPECTOR AND HIS AGENTS WILL SUBMIT A FINAL REPORT OF SPECIAL INSPECTIONS AT THE COMPLETION OF THE SPECIAL INSPECTIONS STATING WORK WAS COMPLETED IN SUBSTANTIAL CONFORMANCE WITH CONTRACT DOCUMENTS. FINAL REPORT OF SPECIAL INSPECTIONS SHALL STATE REQUIRED INSPECTIONS HAVE BEEN COMPLETED AND ITEMIZE NONCONFORMING WORK NOT CORRECTED OR RESOLVED AS COORDINATED WITH THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. FINAL REPORT OF SPECIAL INSPECTIONS IS INCLUDED WITH THE STATEMENTS OF SPECIAL INSPECTIONS FOR USE BY THE SPECIAL INSPECTOR(S) AND HIS AGENTS.
4. SPECIAL INSPECTOR AND HIS AGENTS WILL INTERPRET TESTS AND INSPECTIONS AND STATE IN EACH REPORT WHETHER TESTED AND INSPECTED WORK COMPLIES WITH OR DEVIATES FROM THE CONTRACT DOCUMENTS.
5. SPECIAL INSPECTOR AND HIS AGENTS WILL RETEST AND REINSPECT CORRECTED WORK.
6. OWNER'S SELECTION OF A SPECIAL INSPECTOR IN NO WAY RELIEVES THE CONTRACTOR OF RESPONSIBILITY TO PERFORM WORK IN FULL COMPLIANCE WITH CONTRACT DOCUMENTS.
- H. SUBMITTALS:
1. SPECIAL INSPECTOR AND AGENCY QUALIFICATION DATA. INSPECTION AGENCIES SHALL SUBMIT A COPY OF THEIR QUALIFICATIONS, INCLUDING NAMES AND QUALIFICATIONS OF EACH INSPECTOR AND TECHNICIAN WHO WILL BE PERFORMING INSPECTIONS OR TESTS, TO THE CODE ENFORCEMENT OFFICIAL. SPECIAL INSPECTOR AND AGENCY SHALL BE ACCEPTABLE TO THE CODE ENFORCEMENT OFFICIAL.
2. REPORTS: SPECIAL INSPECTORS SHALL SUBMIT INSPECTION REPORTS OF EACH TEST OR INSPECTION TO THE CONTRACTOR, ARCHITECT OF RECORD, STRUCTURAL ENGINEER OF RECORD, DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE, AND THE OWNER. REPORTS TO BE SUBMITTED ON FORMS APPROVED BY THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. ALL DEFICIENCIES SHALL BE HIGHLIGHTED IN REPORTS AND PRESENCE OF DEFICIENCIES SHALL BE NOTED WITHIN THE REPORT TITLE.
3. PERMITS, LICENSES, AND CERTIFICATES: FOR OWNER'S RECORDS, SUBMIT COPIES OF CERTIFICATIONS, INSPECTION REPORTS, RELEASES, DEFICIENCIES, ARCHITECT/ENGINEER SKETCHES REGARDING DEFICIENCIES, CORRESPONDENCE, RECORDS, AND SIMILAR DOCUMENTS ESTABLISHED FOR COMPLIANCE WITH THE SPECIAL INSPECTIONS PROGRAM DOCUMENTED BY THE SPECIAL INSPECTION STATEMENT AND SCHEDULE.
- I. OWNER WILL ENGAGE AND PAY FOR SERVICES OF SPECIAL INSPECTOR AND HIS AGENTS AND ENGAGE EITHER THE ARCHITECT OR ONE OF HIS CONSULTANTS TO ACT AS THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND PAY FOR SERVICES OF ADMINSTRATING THIS PROGRAM.
- J. CONTRACTOR RESPONSIBILITIES:
1. CONTRACTOR TO WHOM BUILDING PERMIT IS ISSUED SHALL HAVE AND MAINTAIN RESPONSIBILITY TO MANAGE, DIRECT, AND CONTROL CONSTRUCTION ACTIVITIES ON PROJECT FOR WHICH BUILDING PERMIT IS ISSUED.
2. CONTRACTOR SHALL DESIGNATE A REPRESENTATIVE WHO SHALL BE THE DIRECT POINT-OF-CONTACT WITH THE SPECIAL INSPECTOR(S) DURING EACH PHASE OF WORK. DESIGNATED REPRESENTATIVE WILL WORK WITH THE SPECIAL INSPECTOR(S) AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE TO COMMUNICATE AND COORDINATE FOR CORRECTIVE ACTIONS REQUIRED FOR DISCREPANCIES NOTED DURING WORK PROGRESS.
3. CONTRACTOR SHALL REVIEW THE SCHEDULE OF SPECIAL INSPECTIONS TO BECOME FAMILIAR WITH ALL OF THE REQUIRED TESTING AND INSPECTIONS AND SHALL COOPERATE WITH SPECIAL INSPECTOR(S) TO PROVIDE ACCESS TO CONSTRUCTION ACTIVITIES AND MANUFACTURERS OPERATIONS THAT ARE TO BE TESTED/INSPECTED.
4. PROVIDE REQUIRED COPIES OF PRODUCT TEST REPORTS TO SPECIAL INSPECTOR(S).
5. SECURE AND DELIVER TO SPECIAL INSPECTOR(S) ADEQUATE QUANTITIES OF REPRESENTATIVE MATERIAL SAMPLES THAT REQUIRE TESTING/INSPECTION AS PART OF THE SCHEDULE OF SPECIAL INSPECTIONS.
6. PROVIDE INCIDENTAL LABOR AND FACILITIES TO FACILITATE TESTS AND INSPECTIONS THAT ARE REQUIRED BY SPECIAL INSPECTIONS AND NOTED IN THE SCHEDULE OF SPECIAL INSPECTIONS, TO PROVIDE ACCESS TO CONSTRUCTION ACTIVITIES TO BE TESTED, TO OBTAIN AND HANDLE SAMPLES AT PROJECT SITE OR AT SOURCE OF PRODUCT TO BE TESTED, FOR STORAGE AND CURING OF TEST SAMPLES.
7. NOTIFY SPECIAL INSPECTOR(S) AND HIS AGENTS AT LEAST 48 HOURS IN ADVANCE OF REQUIRED INSPECTION OR TEST WHEN TESTS OR INSPECTIONS CANNOT BE PERFORMED AFTER SUCH NOTICE. IMMEDIATELY NOTIFY SPECIAL INSPECTOR TO DISCUSS ALTERATIONS OF WORK AND SUBSEQUENT INSPECTIONS) TO ALLOW FOR REQUIRED TESTING/INSPECTION BY SPECIAL INSPECTOR(S). IF THE SPECIAL INSPECTOR IS NOT NOTIFIED IN TIME TO CANCEL AND RESCHEDULE ANY REQUIRED INSPECTION, THE CONTRACTOR SHALL REIMBURSE OWNER THROUGH CHANGE ORDER PROCEDURE FOR SPECIAL INSPECTOR(S) PERSONNEL AND TRAVEL EXPENSES INCURRED. CONTRACTOR, SPECIAL INSPECTOR, AND OWNER SHALL DEVELOP PROCEDURES AND ASSOCIATED COSTS FOR THE CHANGE ORDER PROCEDURE NOTED.
8. CONTRACTOR IS RESPONSIBLE FOR RETESTING WHERE RESULTS OF INSPECTIONS, TESTS, OR OTHER QUALITY-CONTROL SERVICES PROVE UNSATISFACTORY AND INDICATE NONCOMPLIANCE WITH CONSTRUCTION DOCUMENT REQUIREMENTS, REGARDLESS OF WHETHER ORIGINAL TEST WAS CONTRACTOR'S RESPONSIBILITY.
9. COST OF CONSTRUCTION RELATED TO RETESTING, DEFICIENCIES, CORRECTIVE WORK, REVISED OR REPLACED BY CONTRACTOR, IS CONTRACTOR'S RESPONSIBILITY WHERE REQUIRED TESTS PERFORMED ON ORIGINAL CONSTRUCTION INDICATED NONCOMPLIANCE WITH CONSTRUCTION DOCUMENT REQUIREMENTS.
10. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SITE SAFETY.
- K. SPECIAL INSPECTOR(S) RESPONSIBILITIES:
1. REVIEW ALL SPECIAL INSPECTION STATEMENTS AND THE SCHEDULE OF SPECIAL INSPECTIONS AND BECOME FAMILIAR WITH THE STRUCTURAL DESIGN FOR THE PROJECT AND CONSTRUCTION REQUIREMENTS, SUCH THAT THE INSPECTOR(S) AND HIS AGENTS MAY PROVIDE ADEQUATE VERIFICATION OBSERVATIONS TO ASSURE CONFORMANCE WITH CONSTRUCTION DOCUMENTS.
2. REVIEW CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS CITED IN SUFFICIENT DETAIL THAT HE MAY ASSURE HIMSELF THAT CONFORMANCE IS PROVIDED.
3. CONTACT LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE TO DETERMINE REQUIREMENTS FOR TESTING/INSPECTION REPORT AND NONCONFORMANCE LOG FORMATTING AND FREQUENCY. DETERMINE IF ALL REPORTING WILL BE TRANSMITTED TO THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OR IF ANY OF THE REPORTING MUST ALSO BE TRANSMITTED DIRECTLY FROM THE SPECIAL INSPECTOR(S) TO THE LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL.
4. CONSULT WITH THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FOR CLARIFICATION REGARDING QUESTIONS FROM THE SITE, DEFICIENCIES, AND MISINTERPRETATIONS OF THE WORK.
5. ATTEND PRECONSTRUCTION MEETINGS AND ROUTINE JOB CONFERENCES CALLED BY CONTRACTOR.
6. PROVIDE ON-SITE TESTING, INSPECTIONS, AND OBSERVATIONS OF PHASES OF WORK IN ACCORDANCE WITH FREQUENCIES NOTED FOR EACH TYPE OF INSPECTION IN THE SCHEDULE OF SPECIAL INSPECTIONS AND TO ASSURE HIMSELF CONTRACTOR IS PERFORMING WORK IN ACCORD WITH CONSTRUCTION DOCUMENTS.
7. RECEIVE AND REVIEW REQUIRED CONTRACTOR SUBMITTALS FOR VERIFICATION OF CONFORMANCE TO CONSTRUCTION DOCUMENTS.
8. PROVIDE LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE WITH PERIODIC SPECIAL INSPECTION REPORTS, ALL TESTING/INSPECTION DOCUMENTATION, AND REPORTS OF OUTSTANDING/RESOLVED NONCONFORMANCES WITH REPORT FORMATS AND REPORT FREQUENCIES COORDINATED AT THE START OF THE SPECIAL INSPECTIONS PROGRAM.
- L. LIMITS ON AUTHORITY
1. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT RELEASE, REVOKE, ALTER, OR ENLARGE ON REQUIREMENTS OF CONTRACT DOCUMENTS.
2. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT HAVE CONTROL OVER CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION.
3. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT HAVE AUTHORITY TO STOP WORK.
- M. COMMUNICATION
1. TESTING AGENCY SHALL IMMEDIATELY NOTIFY CONTRACTOR AND REGISTERED DESIGN PROFESSIONAL BY E-MAIL OF TEST RESULTS OR INSPECTIONS FAILING TO COMPLY WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS.
2. SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY CONTRACTOR OF WORK FOUND TO BE IN NONCONFORMANCE WITH THE CONTRACT DOCUMENTS. IF NONCONFORMING WORK IS NOT CORRECTED WHILE THE SPECIAL INSPECTOR IS ON-SITE, SPECIAL INSPECTOR SHALL NOTIFY REGISTERED DESIGN PROFESSIONAL WITHIN 24 HOURS (ONE BUSINESS DAY) AND ISSUE A NONCONFORMANCE REPORT.
3. IF NONCONFORMING WORK IS NOT CORRECTED AT TIME OF SUBSTANTIAL COMPLETION OF STRUCTURE OR OTHER APPROPRIATE TIME, SPECIAL INSPECTOR SHALL NOTIFY CODE ENFORCEMENT OFFICIAL.
4. SPECIAL INSPECTOR AND HIS AGENTS SHALL SUBMIT REPORTS WITHIN 7 DAYS OF INSPECTION OR TEST.
- N. REPAIR AND PROTECTION:
1. GENERAL: UPON COMPLETION OF INSPECTION, TESTING, SAMPLE TAKING, AND SIMILAR SERVICES, REPAIR DAMAGED CONSTRUCTION AND RESTORE SUBSTRATES AND FINISHES TO ELIMINATE DEFICIENCIES, INCLUDING DEFICIENCIES IN VISUAL QUALITIES OF EXPOSED FINISHES.
2. PROTECT CONSTRUCTION EXPOSED BY, OR FOR, QUALITY CONTROL SERVICE ACTIVITIES, AND PROTECT REPAIRED CONSTRUCTION.
3. REPAIR AND PROTECTION IS CONTRACTOR'S RESPONSIBILITY, REGARDLESS OF ASSIGNMENT OF RESPONSIBILITY FOR INSPECTION, TESTING, OR SIMILAR SERVICES.

1705.2.1 REQUIRED VERIFICATION AND INSPECTION OF STRUCTURAL STEEL

MATERIAL / ACTIVITY	SERVICE¹	APPLICABLE TO THIS PROJECT				
		Y/N	EXTENT	REFERENCED STANDARD²	AGENT¹	DATE COMPLETED
1. MATERIAL VERIFICATION OF STRUCTURAL STEEL	SHOP³ AND FIELD INSPECTION	Y	PERIODIC		1	
2. EMBEDMENTS (VERIFY DIAMETER, GRADE, TYPE, LENGTH, EMBEDMENT. SEE 1705.3 FOR ANCHORS)	FIELD INSPECTION	N	PERIODIC		1	
3. VERIFY MEMBER LOCATIONS, BRACES, STIFFENERS, AND APPLICATION OF JOINT DETAILS AT EACH CONNECTION COMPLY WITH CONSTRUCTION DOCUMENTS	FIELD INSPECTION	Y	PERIODIC		1	
4. FABRICATOR AND ERECTION DOCUMENTS	SUBMITTAL REVIEW	Y	EACH SUBMITTAL	AISC360-10: N3.2.1-13	1	
5. INSPECTION TASKS PRIOR TO WELDING				AISC360-10: N5.4.5.5, & TABLE N5.4-1		
a. WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	VERIFY	Y	PERFORM	AWS D1.1-6.3	1	
b. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	VERIFY	Y	PERFORM	AWS D1.1-6.2	1	
c. MATERIAL IDENTIFICATION (TYPE/GRADE)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-6.2	1	
d. WELDER IDENTIFICATION SYSTEM (THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED, STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-6.4	1	
e. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)						
i. JOINT PREPARATION	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-6.5.2	1	
ii. DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.22	1	
iii. CLEANLINESS (CONDITION OF STEEL SURFACES)	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.15	1	
iv. TACKING (TACK WELD QUALITY AND LOCATION)	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.18	1	
v. BACKING TYPE AND FIT (IF APPLICABLE)	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.10 & 5.22.1.1	1	
f. CONFIGURATION AND FINISH OF ACCESS HOLES	SHOP³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-6.5.2 & 5.17	1	
g. FIT-UP OF FILLET WELDS						
i. DIMENSIONS (ALIGNMENT, GAPS AT ROOT)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.22.1	1	
ii. CLEANLINESS (CONDITION OF STEEL SURFACES)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.15	1	
iii. TACKING (TACK WELD QUALITY AND LOCATION)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.18	1	
6. INSPECTION TASKS DURING WELDING				AISC360-10: N5.4, 5.5, & TABLE N5.4-2		
a. USE OF QUALIFIED WELDERS	VERIFY	Y	OBSERVE	AWS D1.1-6.4	1	
b. CONTROL AND HANDLING OF WELDING CONSUMABLES				AWS D1.1-6.2		
i. PACKAGING	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.3.1	1	
ii. EXPOSURE CONTROL	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.3.2 & 5.3.3	1	
c. NO WELDING OVER CRACKED TACK WELDS	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.18	1	
d. ENVIRONMENTAL CONDITIONS						
i. WIND SPEED WITHIN LIMITS	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AISC 360-10: N5.4 & TABLE N5.4.2	1	
ii. PRECIPITATION AND TEMPERATURE	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AISC 360-10: N5.4 & TABLE N5.4.2	1	
e. WPS FOLLOWED				AWS D1.1-6.3.3, 6.5.2, & 6.5.2.1	1	
i. SETTINGS ON WELDING EQUIPMENT	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
ii. TRAVEL SPEED	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
iii. SELECTED WELDING MATERIALS	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
iv. SHIELDING GAS TYPE/FLOW RATE	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
v. PREHEAT APPLIED	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.6 & 5.7	1	
vi. INTERPASS TEMPERATURE MAINTAINED (MIN/MAX)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
vii. PROPER POSITION (F, V, H, OH)	SHOP³ AND FIELD INSPECTION	Y	OBSERVE		1	
f. WELDING TECHNIQUES				AWS D1.1-6.5.2, 6.5.3, & 6.5.24		
i. INTERPASS AND FINAL CLEANING	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.30.1	1	
ii. EACH PASS WITHIN PROFILE LIMITATIONS	SHOP³ AND FIELD INSPECTION	Y	OBSERVE			
iii. EACH PASS MEETS QUALITY REQUIREMENTS	SHOP³ AND FIELD INSPECTION	Y	OBSERVE			
7. INSPECTION TASKS AFTER WELDING				AISC360-10: N5.4, 5.5, & TABLE N5.4-3		
a. WELDS CLEANED	SHOP³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.30.1	1	

1705.2.1 REQUIRED VERIFICATION AND INSPECTION OF STRUCTURAL STEEL (CONT.)

MATERIAL / ACTIVITY	SERVICE²	APPLICABLE TO THIS PROJECT				
		Y/N	EXTENT	REFERENCED STANDARD³	AGENT	DATE COMPLETED
b. SIZE, LENGTH, AND LOCATION OF WELDS	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-6.5.1	1	
c. WELDS MEET VISUAL ACCEPTANCE CRITERIA				AWS D1.1-6.5.3		
i. CRACK PROHIBITION	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (1)	1	
ii. WELDBASE-METAL FUSION	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (2)	1	
iii. CRATER CROSS SECTION	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (3)	1	
iv. WELD PROFILES	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (4) & 5.24	1	
v. WELD SIZE	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (6)	1	
vi. UNDERCUT	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (7)	1	
vii. POROSITY	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (8)	1	
d. ARC STRIKES	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-5.29	1	
e. K-AREA	SHOP³ AND FIELD INSPECTION	N	PERFORM	WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3" OF THE WELD.	1	
f. BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED BY CONSTRUCTION DOCUMENTS)	SHOP³ AND FIELD INSPECTION	N	PERFORM	AWS D1.1-5.10 & 5.31	1	
g. REPAIR ACTIVITIES	SHOP³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-6.5.3 & 5.26	1	
h. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	DOCUMENTATION	Y	PERFORM	AWS D1.1-6.5.4 & 6.5.5	1	
i. NONDESTRUCTIVE TESTING (NDT) OF WELDED JOINTS⁴:				AISC360-10: 5.5a-g		
1. COMPLETE PENETRATION GROOVE WELDS IN MATERIALS 5/16" THICK OR GREATER IN RISK CATEGORY III OR IV	SHOP³ AND FIELD INSPECTION	N	PERFORM (100%)	AWS D1.1	1	
2. COMPLETE PENETRATION GROOVE WELDS IN MATERIALS 5/16" THICK OR GREATER IN RISK CATEGORY II	SHOP³ AND FIELD INSPECTION	N	PERFORM (10%)	AWS D1.1	1	
3. THERMALLY CUT SURFACES OF ACCESS HOLES WHEN MATERIAL 1" x 2"	SHOP³ AND FIELD INSPECTION	N	PERFORM		1	
4. WELDED JOINTS SUBJECT TO FATIGUE WHEN REQUIRED BY AISC 360, APPENDIX 3, TABLE A-3.1	SHOP³ AND FIELD INSPECTION	N	PERFORM		1	
5. FABRICATOR'S NDT REPORTS WHEN FABRICATOR PERFORMS NDT	VERIFY	N	EACH SUBMITTAL⁵		1	
8. INSPECTION TASKS PRIOR TO BOLTING				AISC360-10: N5.6 & TABLE N5.6-1		
a. MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	VERIFY	N	PERFORM	RCSC-2.1 & 9.1	1	
b. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-FIG. C-2.1 & 9.1	1	
c. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-2.3.2, 2.7.2, & 9.1	1	
d. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-4 & 8	1	
e. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-3, 9.1 & 9.3	1	
f. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	SHOP AND FIELD INSPECTION/ DOCUMENTATION	N	OBSERVE	RCSC-7 & 9.2		
g. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS, AND OTHER FASTENER COMPONENTS	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-2.2, 8, & 9.1	1	
9. INSPECTION TASKS DURING BOLTING				AISC360-10: N5.6 & TABLE N5.6-2		
a. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.1 & 9.1	1	
b. JOINT BROUGHT TO THE SNUG TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.1 & 9.1	1	
c. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.2 & 9.2	1	
d. FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE POST RIGID POINT TOWARD THE FREE EDGES	SHOP³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.2 & 9.2	1	
10. INSPECTION TASKS AFTER BOLTING				AISC360-10: N5.6 & TABLE N5.6-3		
a. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	DOCUMENTATION	N	PERFORM		1	
11. INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION PRIOR TO CONCRETE PLACEMENT				AISC360-10: N6 & TABLE N6.1		
a. PLACEMENT AND INSTALLATION OF STEEL DECK	SHOP³ AND FIELD INSPECTION	N	PERFORM		1	
b. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	SHOP³ AND FIELD INSPECTION	N	PERFORM		1	
c. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS	DOCUMENTATION	N	PERFORM		1	

SPECIAL INSPECTIONS FOOTNOTES

1. THE INSPECTION AND TESTING AGENT(S) SHALL BE ENGAGED BY THE OWNER OR THE OWNER'S AGENT, AND NOT BY THE CONTRACTOR OR SUBCONTRACTOR WHOSE WORK IS TO BE INSPECTED OR TESTED. ANY CONFLICT OF INTEREST MUST BE DISCLOSED TO THE BUILDING OFFICIAL PRIOR TO COMMENCING WORK. THE QUALIFICATIONS OF THE SPECIAL INSPECTOR(S) AND/OR TESTING AGENCIES MAY BE SUBJECT TO THE APPROVAL OF THE BUILDING OFFICIAL AND/OR THE DESIGN PROFESSIONAL.
2. THE LIST OF SPECIAL INSPECTORS MAY BE SUBMITTED AS A SEPARATE DOCUMENT, IF NOTED SO ABOVE.
3. INSPECTION OF FABRICATORS IS NOT REQUIRED WHERE THE FABRICATOR IS APPROVED IN ACCORDANCE WITH IBC SECTION 1704.2.5.1.
4. IN ADDITION TO THIS DOCUMENT, SEE SPECIAL INSPECTION REQUIREMENTS NOTED IN THE GENERAL NOTES OF THE CONSTRUCTION DOCUMENTS AND DIVISION 01 SPECIFICATIONS.
5. SEE REFERENCED STANDARDS FOR ADDITIONAL CLARIFICATION REGARDING INSPECTION SERVICES, TESTING, EXTENTS REQUIRED, AND MODIFICATIONS TO INSPECTIONS AND TESTING BASED ON INSPECTION AND TESTING RESULTS.
6. NDT OF WELDS COMPLETED IN AN APPROVED FABRICATOR'S SHOP MAY BE PERFORMED BY THAT FABRICATOR WHEN APPROVED BY THE AHJ. REFER TO AISC 360, N7.
7. ALL SPECIAL INSPECTIONS SHALL BE SUBMITTED ELECTRONICALLY AS REPORTS PER CHAPTER 17 REQUIREMENTS. SEE IBC SECTION 1704.2.4 FOR CLARIFICATION OF REPORT REQUIREMENTS. SEE SPECIFIC CODE OR STANDARD REFERENCE WHERE ADDITIONAL DOCUMENTATION IS REQUESTED.
8. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE AS INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR OR ADHESIVE, ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 8.2 IN CHAPTER 18 OF THE BUILDING CODE. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.
9. REQUIRED BEFORE EACH CONCRETE POUR OF FOUNDATION ELEMENTS, WALLS, COLUMNS, BEAMS, ELEVATED AND ON-GRADE SLABS WITH SUFFICIENT TIME ALLOWED FOR INSPECTION OF COMPLETED INSTALLED REINFORCING PRIOR TO POUR.
10. 10% (BUT NOT LESS THAN TWO) OF ALL POST INSTALLED ADHESIVE ANCHORS SHALL BE TESTED PER THE PROOF LOADING REQUIREMENTS OF ACI 355.4 SECTION 13.3.4. THESE ANCHORS SHALL BE SELECTED AT RANDOM BY THE SPECIAL INSPECTOR, WHERE 100% OF ANCHORS DO NOT PASS TESTS, A FURTHER 50% OF ALL INSTALLED ANCHORS SHALL BE TESTED. ADHESIVE ANCHORS NOT REQUIRING PROOF ROLLING SHALL BE EXPLICITLY DENOTED IN THE CONSTRUCTION DOCUMENTS.
11. CONCRETE MASONRY ADHESIVE ANCHORS SHALL BE TESTED IN ACCORDANCE WITH REQUIREMENTS ASSOCIATED WITH ACI 355.4 SECTION 13.3.

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PES PROJECT NUMBER 0219137



11/13/2020

No.	Date	Description
		REVISION
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
		ISSUE

PROJECT

Greenwich Public Schools
WMS Auditorium AC Upgrade

1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING
TITLE

**SPECIAL
INSPECTIONS**

Drawn By

TJL

Drawing
No.

Checked By

DPA

Date

11/13/2020

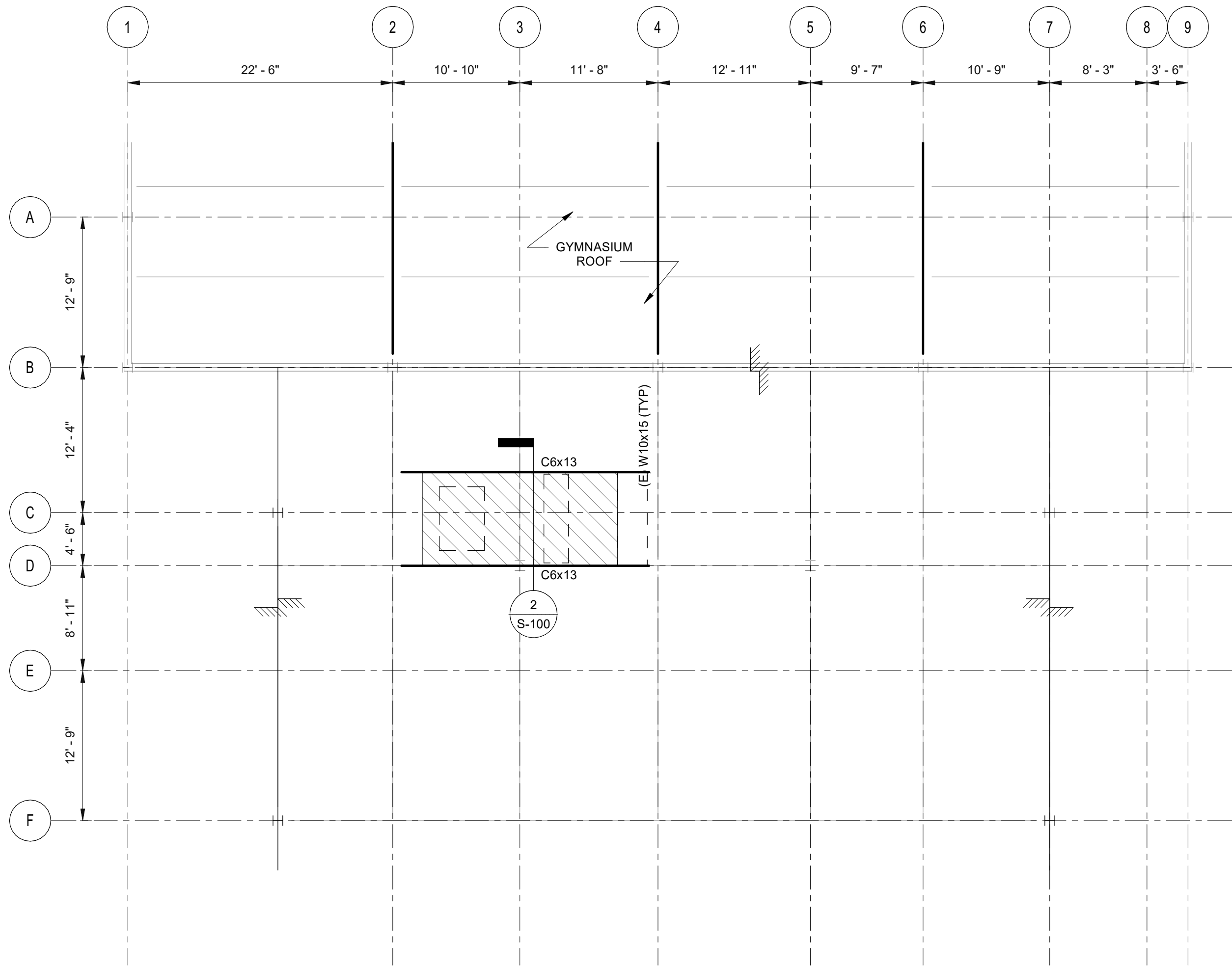
Scale

1" = 1'-0"

Project No.

190911-000

S-002

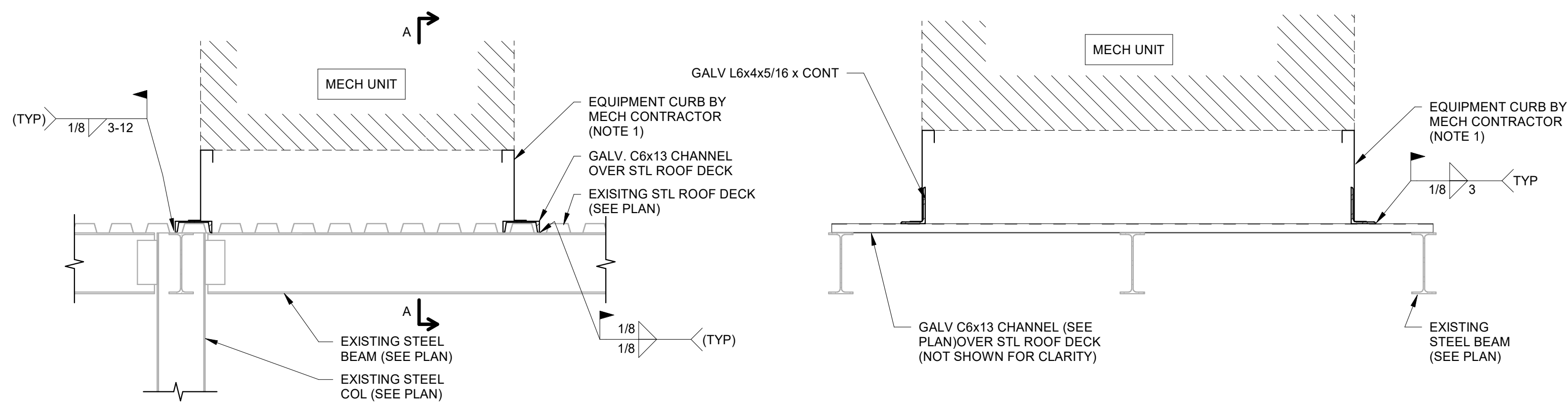


PARTIAL ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:

1. (1) DENOTES EXISTING 1-1/2" METAL ROOF DECK
2. (hatched) DENOTES CHANGE IN ROOF ELEVATION
3. EXISTING FRAMING SHOWN FOR REFERENCE ONLY. GC SHALL VERIFY DIMENSIONS SHOWN.
4. FOR UNIT CURB SUPPORT FRAMING - SEE 2/S-100
5. PROVIDE SUPPORT FRAME AT ROOF OPENINGS PER 3/S-100
6. (hatched) DENOTES NEW ROOFTOP UNIT + CURB (APPROX WT = 8200 LBS)
7. LOCATE UNIT AS SHOWN ON PLANS. NOTIFY PES STRUCTURAL ENGINEERS IF UNIT IS RELOCATED.



SECTION A-A

NOTES:

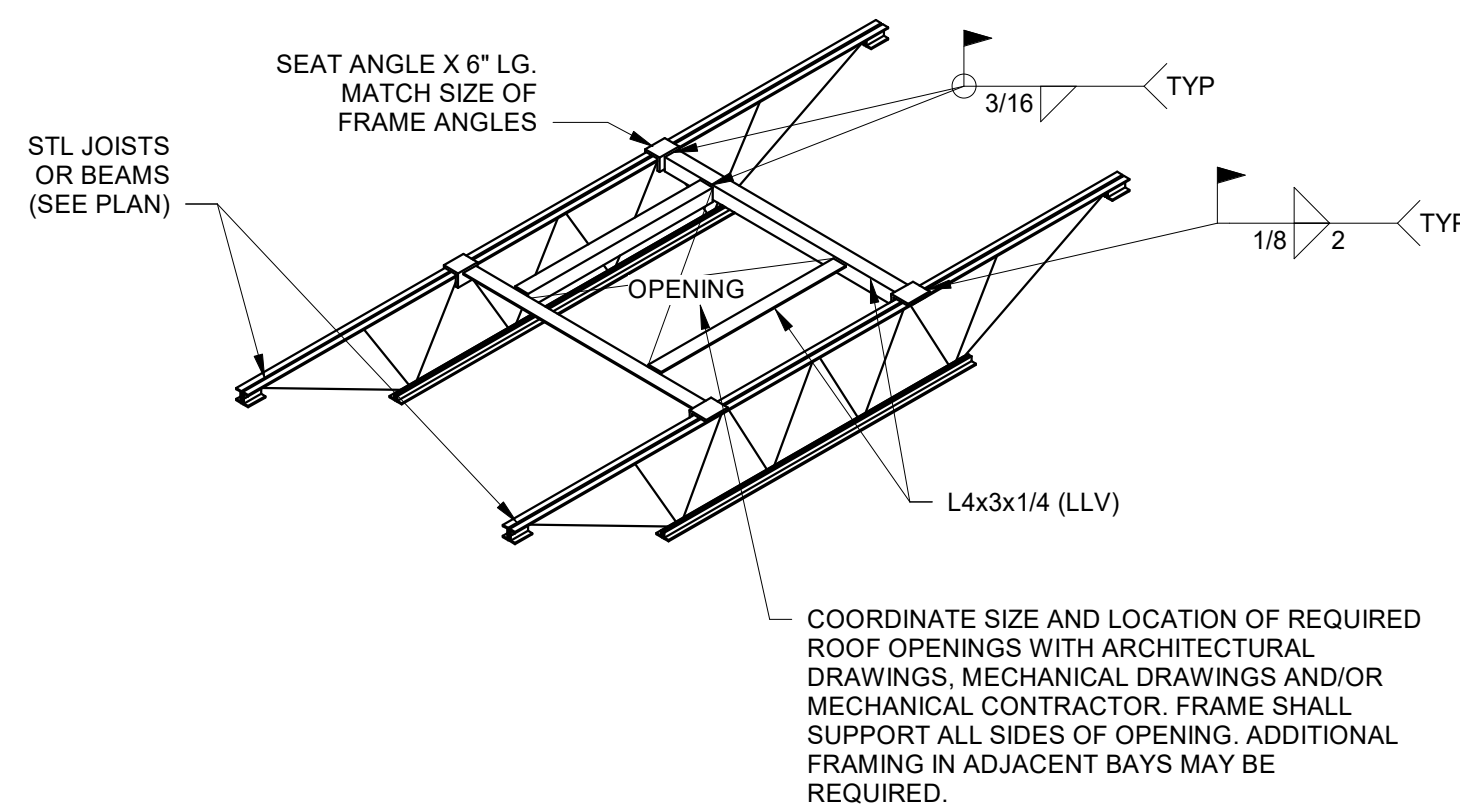
1. COORDINATE SIZE AND LOCATION OF EQUIPMENT CURB WITH MECHANICAL CONTRACTOR. CURB SHALL BE SUPPORTED ON ALL SIDES.
2. ANCHOR EQUIPMENT AND CURB TO MISCELLANEOUS FRAMING SHOWN AS REQUIRED FOR WIND AND/OR SEISMIC FORCES. COORDINATE WITH EQUIPMENT/CURB MANUFACTURER (CONNECTION DESIGN NOT BY PES STRUCTURAL ENGINEERS).
3. NOTIFY ENGINEER IF EQUIPMENT SIZE AND/OR WEIGHT (INCLUDING CURB) EXCEEDS WEIGHT NOTED ON PLANS.
4. IN ADDITION TO CURB SUPPORT FRAME, INSTALL TYPICAL ROOF OPENING FRAME TO SUPPORT DECK AT PERIMETER OF OPENINGS. SEE TYPICAL ROOF OPENING FRAME DETAIL FOR ADDITIONAL INFORMATION.
5. PROVIDE LARGER FRAMING MEMBERS AS REQUIRED FOR ANCHORAGE OF EQUIPMENT CURB.

TYPICAL EQUIPMENT CURB SUPPORT - SECTION

SCALE: 3/4" = 1'-0"

2

S-100



NOTES:

1. PROVIDE FRAMING AT ROOF DRAINS.
2. WELD/CONNECT DECK TO ALL FRAMING AT 8" OC MAXIMUM SPACING. COORDINATE WITH ENGINEER FOR SPECIAL DETAILS REQUIRED TO CONNECT ANGLES TO EXISTING DECK IN AN INSTALLATION OF NEW UNIT ON EXISTING ROOF FRAMING.
3. ANCHOR EQUIPMENT AND CURB TO MISCELLANEOUS FRAMING SHOWN AS REQUIRED FOR WIND AND/OR SEISMIC FORCES. COORDINATE WITH EQUIPMENT/CURB MANUFACTURER (CONNECTION DESIGN NOT BY PES STRUCTURAL ENGINEERS).
4. THIS DETAIL IS NOT APPLICABLE TO ROOFTOP EQUIPMENT CURBS. REFER TO TYPICAL EQUIPMENT CURB SUPPORT DETAIL FOR CURB SUPPORT FRAMING.

TYPICAL ROOF OPENING DECK SUPPORT FRAMING - ISOMETRIC

SCALE: 3/8" = 1'-0"

3

S-100

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STATE OF CONNECTICUT
DAVID P. AUCTION, P.E.
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PEN 025212
11/13/2020

No.	Date	Description
REVISION		
2	11/13/20	100% CD
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Greenwich Public Schools WMS Auditorium AC Upgrade 1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT		
DRAWING TITLE		
PARTIAL ROOF FRAMING PLAN		
Drawn By	T.J.L.	Drawing No.
Checked By	DPA	
Date	11/13/2020	
Scale	As indicated	
Project No.	190911-000	

S-100

GENERAL

- A. THE FOLLOWING NOTES APPLY TO ALL STRUCTURAL DRAWINGS. NOTES SHALL APPLY UNLESS OTHERWISE INDICATED BY STRUCTURAL DRAWINGS OR SPECIFICATIONS.
- B. WHERE A DETAIL, TYPICAL DETAIL, SECTION, TYPICAL SECTION OR PLAN NOTE IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL SIMILAR OR LIKE CONDITIONS UNLESS NOTED OTHERWISE.
- C. ALL DESIGN AND CONSTRUCTION IS BASED ON AND SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2015 EDITION, WITH APPLICABLE 2018 CT STATE BUILDING CODE AMENDMENTS. ALL REFERENCED STANDARDS SHALL BE OF THE EFFECTIVE DATE NOTED IN THE CONTROLLING BUILDING CODE.
- D. NO PROVISION OF ANY REFERENCED STANDARD SPECIFICATION, MANUAL OR CODE (WHETHER OR NOT SPECIFICALLY INCORPORATED BY REFERENCE IN THE CONSTRUCTION DOCUMENTS) SHALL BE EFFECTIVE TO CHANGE THE DUTIES AND RESPONSIBILITIES OF OWNER, CONTRACTOR, ENGINEER, SUPPLIER, OR ANY OF THEIR CONSULTANTS, AGENTS, OR EMPLOYEES FROM THOSE SET FORTH IN THE CONSTRUCTION DOCUMENTS. NOR SHALL IT BE EFFECTIVE TO ASSIGN TO THE STRUCTURAL ENGINEER OF RECORD OR ANY OF THE STRUCTURAL ENGINEER OF RECORD'S CONSULTANTS, AGENTS, OR EMPLOYEES ANY DUTY OR AUTHORITY TO SUPERVISE OR DIRECT THE FURNISHING OR PERFORMANCE OF THE WORK OR ANY DUTY OR AUTHORITY TO ASSIGN RESPONSIBILITIES CONTRARY TO THE PROVISIONS OF THE CONSTRUCTION DOCUMENTS.
- E. CONSTRUCTION DOCUMENTS INCLUDE, BUT ARE NOT LIMITED TO, THE STRUCTURAL DOCUMENTS (DRAWINGS AND SPECIFICATIONS), BUT DO NOT INCLUDE SHOP DRAWINGS, VENDOR DRAWINGS, OR MATERIAL PREPARED AND SUBMITTED BY THE GENERAL CONTRACTOR.
- F. CONSTRUCTION DOCUMENTS SHALL GOVERN IN THE EVENT OF A CONFLICT WITH THE CODE OF PRACTICE OR SPECIFICATIONS OF ACI, PCI, AISI, SJI OR OTHER STANDARDS, WHERE A CONFLICT OCCURS WITHIN THE CONSTRUCTION DOCUMENTS, THE STRICTEST REQUIREMENT SHALL GOVERN.
- G. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS AND NOTIFY ARCHITECT/STRUCTURAL ENGINEER OF RECORD OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH WORK. FOR DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS, SEE ARCHITECTURAL DRAWINGS.
- H. DO NOT SCALE FOR DIMENSIONS NOT SHOWN ON DRAWINGS. SEND WRITTEN REQUEST FOR INFORMATION TO THE ARCHITECT FOR DIMENSIONS NOT PROVIDED.
- I. THE STRUCTURE SHOWN ON THESE DRAWINGS IS SELF-SUPPORTING ONLY IN ITS COMPLETED FORM. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE DESIGN, ADEQUACY, SAFETY, AND STABILITY OF TEMPORARY ERECTION BRACING AND SHORING.
- J. NO PROVISIONS HAVE BEEN MADE IN THE DESIGN FOR THE SUPPORT OF A CONCENTRATED LOAD FROM PLUMBING, MECHANICAL OR HVAC EXCEPT AS SHOWN ON THE DRAWINGS.
- K. THE GENERAL CONTRACTOR SHALL COORDINATE ALL SIZES AND LOCATIONS OF FLOOR, ROOF, AND WALL PENETRATIONS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS. ALL PENETRATIONS NOT SHOWN ON STRUCTURAL DRAWINGS MUST BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD UNLESS NOTED OTHERWISE.
- L. THE GENERAL CONTRACTOR SHALL VERIFY THAT MISCELLANEOUS FRAMING SHOWN ON THE STRUCTURAL DRAWINGS FOR MECHANICAL EQUIPMENT, OWNER-FURNISHED ITEMS, PARTITIONS, ETC. IS CONSISTENT WITH THE REQUIREMENTS OF SUCH ITEMS.
- M. ELEVATIONS SHOWN ARE TO TOP OF FOUNDATIONS, SLABS OR STEEL BEAMS UNLESS NOTED OTHERWISE.
- N. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ORDER TO COMPLY WITH THE CONSTRUCTION DOCUMENTS.
- O. THE GENERAL CONTRACTOR HAS SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE OSHA REGULATIONS.
- P. THE STRUCTURAL ENGINEER OF RECORD HAS DELEGATED THE DESIGN OF PRECAST CONCRETE, GLAZING SYSTEMS, COLD FORMED METAL FRAMING, RAILING, SKYLIGHTS, AND STAIRS, OR OTHER SYSTEMS NOT SHOWN IN THE STRUCTURAL DRAWINGS. SUCH SYSTEMS SHALL BE DESIGNED, FURNISHED, AND INSTALLED AS REQUIRED BY OTHER PORTIONS OF THE CONTRACT DOCUMENTS.
- Q. ALL TESTING SHALL BE PAID FOR BY THE OWNER. CONTRACTOR SHALL COORDINATE WITH OWNER TO ENSURE THAT AT COST OF TESTING IS ACCURATE AND PRESENTED TO OWNER WITH CONSTRUCTION COSTS).

SHOP DRAWINGS

- A. STRUCTURAL DRAWINGS INDICATE TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. SHOP DRAWINGS SHALL DETAIL ALL CONDITIONS IN ACCORDANCE WITH SPECIFIED STANDARDS AND THE SPECIFIC REQUIREMENTS OF THIS PROJECT AS INDICATED IN THE CONSTRUCTION DOCUMENTS.
- B. THE GENERAL CONTRACTOR SHALL SUBMIT, AS REQUIRED, PRINTS OR ELECTRONIC COPIES, AS DIRECTED, OF SHOP DRAWINGS FOR ALL FABRICATED MATERIALS TO ARCHITECT FOR REVIEW.
- C. REVIEW OF SHOP DRAWINGS BY THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD DOES NOT RELIEVE THE GENERAL CONTRACTOR OF THE SOLE RESPONSIBILITY FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF THOSE SHOP DRAWINGS.
- D. SHOP DRAWINGS AND CALCULATIONS FOR DELEGATED DESIGN ITEMS AS DICTATED BY THE CONSTRUCTION DOCUMENTS SHALL BE SIGNED AND SEALED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED BEFORE SUBMITTING FOR REVIEW BY THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- E. COMPLETE SHOP DRAWINGS FOR CONSTRUCTION OF ALL APPLICABLE SPECIALTY ITEMS INCLUDING, BUT NOT LIMITED TO PRECAST CONCRETE, GLAZING SYSTEMS, COLD FORMED METAL FRAMING, RAILING, SKYLIGHTS, AND STAIRS SHALL BE SIGNED AND SEALED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, AND SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.
- F. REPRODUCTION OR REPRODUCTION OF THE STRUCTURAL DRAWINGS FOR USE IN THE PRODUCTION OF SHOP DRAWINGS IS PROHIBITED, UNLESS NOTED OTHERWISE. IN THE EVENT THAT THE GENERAL CONTRACTOR OR SUBCONTRACTOR ELECTS TO PRODUCE SHOP DRAWINGS BY COPYING ELECTRONIC OR OTHER COPIES OF THE STRUCTURAL DRAWINGS, THE CONTRACTOR SHALL REQUEST FROM THE STRUCTURAL ENGINEER OF RECORD A SHOP DRAWING WAIVER ALONG WITH THE SPECIFIC SHEETS REQUIRED. SIGNATURE OF THE WAIVER BY THE GENERAL CONTRACTOR, ALONG WITH PAYMENT OF A FEE TO THE STRUCTURAL ENGINEER OF RECORD WILL BE REQUIRED. THE GENERAL CONTRACTOR SHALL CONTINUE TO ASSUME RESPONSIBILITY FOR ERRORS, OMISSIONS AND COORDINATION REQUIRED FOR SHOP DRAWING PRODUCTION, REGARDLESS OF THE USE OF COPIES OF THE STRUCTURAL DRAWINGS FOR SHOP DRAWING PRODUCTION.

EXISTING CONDITIONS

- A. THE GENERAL CONTRACTOR SHALL SURVEY THE EXISTING STRUCTURE TO DETERMINE THAT ALL MODIFICATIONS AS INDICATED IN THE CONSTRUCTION DOCUMENTS ARE FEASIBLE AND PRACTICAL AND SHALL REPORT ANY DISCREPANCIES OR UNUSUAL CONDITIONS TO THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- B. WHEN EXISTING FRAMING IS SHOWN ON THE STRUCTURAL DRAWINGS IT IS FOR REFERENCE ONLY AS IT RELATES TO THE SCOPE OF WORK. THE STRUCTURAL DRAWINGS ARE NOT INTENDED TO BE A COMPREHENSIVE REPRESENTATION OF THE AS-BUILT EXISTING STRUCTURE.
- C. WHERE PORTIONS OF THE NEW CONSTRUCTION ARE INDICATED TO FIT TO EXISTING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL VERIFY DIMENSIONS OF EXISTING CONSTRUCTION BY FIELD MEASUREMENTS BEFORE SUBMISSION OF SHOP DRAWINGS AND FABRICATION.
- D. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES IN THE AREA OF CONSTRUCTION THAT MIGHT BE AFFECTED BY OR OTHERWISE INTERFERE WITH INSTALLATION OF NEW WORK. THIS INCLUDES THOSE THAT MIGHT BE DAMAGED BY NEW FOUNDATION OR OTHER WORK, AND THOSE WHOSE PRESENCE MIGHT LEAD TO DAMAGE TO THE NEW WORK (SUCH AS DIFFERENTIAL SETTLEMENT, ETC.).

DESIGN LOADS

- A. DESIGN ROOF DEAD LOAD:
1. SELF WEIGHT OF STRUCTURE + 10 PSF (ASSUMED)
- B. DESIGN ROOF LIVE LOAD:
1. 20 PSF
2. MECHANICAL UNIT (SEE PLAN FOR WEIGHT)
3. REDUCTIONS APPLIED PER TRIBUTARY AREA AS PERMITTED BY CODE
- C. DESIGN SNOW LOAD:
1. GROUND SNOW LOAD, $P_g = 30$ PSF
2. FLAT ROOF SNOW LOAD, $P_f = 23.1$ PSF (USED FOR DRIFT & UNBALANCED LOADING)
3. MINIMUM ROOF SNOW LOAD, $P_m = 30$ PSF (PER CT STATE BUILDING CODE)
4. SNOW EXPOSURE FACTOR, $C_e = 1.0$
5. SNOW IMPORTANCE FACTOR, $I_s = 1.1$
6. SNOW THERMAL FACTOR, $C_t = 1.0$
- D. DESIGN WIND LOAD:
1. ULTIMATE DESIGN WIND SPEED, $V_{ult} = 130$ MPH
2. NOMINAL DESIGN WIND SPEED $V_{asd} = 101$ MPH
3. RISK CATEGORY: III
4. WIND EXPOSURE CATEGORY: B
5. COMPONENTS AND CLADDING WIND PRESSURE: 50 PSF (H2), 39 PSF (UPLIFT)
6. INTERNAL PRESSURE COEFFICIENT (C_{pi}): +/- 0.18
- E. DESIGN SEISMIC INFORMATION:
1. RISK CATEGORY: III
2. MAPPED SPECTRAL RESPONSE COEFFICIENT, $S_s = 0.259$
3. MAPPED SPECTRAL RESPONSE COEFFICIENT, $S_1 = 0.070$
4. SPECTRAL RESPONSE COEFFICIENT, $S_{ds} = 0.275$
5. SPECTRAL RESPONSE COEFFICIENT, $S_{d1} = 0.112$
6. SITE CLASS: D (ASSUMED)
7. BASE SEISMIC-FORCE RESISTING SYSTEM: OTHER MECHANICAL OR ELECTRICAL COMPONENTS
8. DESIGN SEISMIC FORCE: 0.9 K
9. ANALYSIS PROCEDURE: NONSTRUCTURAL COMPONENTS (ASCE 7, SECTION 13.6)
10. RESPONSE MODIFICATION FACTOR, $R_p = 1.5$
11. COMPONENT AMPLIFICATION FACTOR, $a_p = 1.0$
12. SEISMIC DESIGN CATEGORY: B
13. SEISMIC IMPORTANCE FACTOR, $I_e = 1.25$
- F. NO PROVISIONS HAVE BEEN MADE FOR FUTURE HORIZONTAL OR VERTICAL EXPANSION.

SUSPENDED LOADS AT STRUCTURE

- A. ATTACHMENT TO ROOF DECK FOR ANY SUSPENDED LOADS IS PROHIBITED WITHOUT WRITTEN APPROVAL FROM ARCHITECT/STRUCTURAL ENGINEER OF RECORD.
- B. PIPE HANGERS SHALL BE ATTACHED TO BOTTOM FLANGES OF JOISTS OR BEAMS WITH APPROVED CLAMPS/CONNECTIONS.
- C. ALL MULTIPLE TIER CABLE TRAYS, PIPE RACKS OR GROUPS OF PIPES OR DUCTS SHALL BE SUPPORTED FROM EACH ROOF FRAMING MEMBER WHERE THE GROUP CROSSES THE MEMBER OR AT 8'-0" O.C. MAX. WHERE GROUP IS ORIENTED PARALLEL TO THE MEMBER, UNLESS NOTED OTHERWISE ON DRAWINGS.
- D. HANGERS SHALL BE ADDED AT ALL PIPE VALVE AND FITTING LOCATIONS.
- E. CONTRACTORS AND SUBCONTRACTORS SUSPENDING LOADS FROM STRUCTURE SHALL ACCOUNT FOR AND PROVIDE ALL CONNECTIONS, STRUTS, TIES AND RIGGING REQUIRED FOR COMPLETE INSTALLATION AND SHALL FURNISH DRAWINGS SHOWING POINTS OF SUPPORT, SUPPORT LOADS AND ALL REQUIRED SUPPLEMENTAL BRACING, PROVIDE SUPPORTS AND HANGERS AS REQUIRED FOR PIPING AND EQUIPMENT SO THAT ALL COMBINED LOADING SHALL NOT EXCEED ALLOWABLE LOADINGS OF STRUCTURE AS SHOWN ON STRUCTURAL DRAWINGS. SUPPORT LOCATIONS SHALL BE COORDINATED WITH OTHER TRADES AND SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATIONS OF THE ITEMS SUPPORTED.
- F. EXPENSE RESULTING FROM IMPROPER COORDINATION OR LOCATION OF ANCHOR BOLTS, OPENINGS, SLEEVES, INSERTS, HANGERS OR OTHER SUPPORTS REQUIRED FOR PIPING AND EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

WELDING

- A. MINIMUM WELD SIZE SHALL BE 3/16" FILLET WELD UNLESS NOTED OTHERWISE.
- B. WELD FILLER METALS SHALL COMPLY WITH AWS REQUIREMENTS FOR THE APPLICABLE WELD PROCESS AND BASE MATERIAL, AND AS FOLLOWS:
1. USE 70 KSI (E70XX) MINIMUM ELECTRODES UNLESS NOTED OTHERWISE.
2. USE 80 KSI (E80XX) ELECTRODES FOR WELDING AT COLD FORMED STEEL FRAMING, AND FOR PUDDLE WELDS OF COMPOSITE DECK, ROOF DECK AND NON-COMPOSITE DECK TO SUPPORTS WHEN DECK THICKNESS IS 22 GAGE OR GREATER.
3. USE 70 KSI (E70XX) ELECTRODES FOR PUDDLE WELDS OF COMPOSITE DECK, ROOF DECK AND NON-COMPOSITE DECK TO SUPPORTS WHEN DECK THICKNESS IS LESS THAN 22 GAGE AND WELDS ARE MADE THROUGH WELD WASHERS.
- C. FIELD WELDING SHALL BE SHOWN ON SHOP DRAWINGS AND ERECTION DRAWINGS.
- D. REFER TO ARCHITECTURAL DOCUMENTS FOR EXPOSED STEEL AND JOINT LOCATIONS AND REQUIREMENTS. ALL EXPOSED WELDED CONNECTIONS SHALL BE GRIND SMOOTH AND SUBJECT TO ARCHITECT APPROVAL. FABRICATOR SHALL ALTER JOINT DETAILING AS REQUIRED TO ENSURE THAT EFFECTIVE WELD THROAT SPECIFIED IN WELD DETAIL IS MAINTAINED AFTER GRINDING OF WELD SURFACE.
- E. WELDS INDICATED IN STRUCTURAL DETAILS ARE INTENDED AS THE BASIS OF DESIGN. FABRICATOR AND ERECTOR HAVE THE OPTION TO PROPOSE THE USE OF ALTERNATIVE WELDING PROCEDURES. ALTERNATIVE WELDS SHALL BE INDICATED ON SHOP DRAWINGS FOR REVIEW BY THE STRUCTURAL ENGINEER OF RECORD.
- F. REINFORCING STEEL WELDING SHALL CONFORM TO AWS D1.4, STRUCTURAL WELDING CODE - REINFORCING STEEL BY AMERICAN WELDING SOCIETY FOR COMPLIANCE WITH AISC 318, SECTION 3.5.2.
- G. ALL WELDED CONNECTIONS SHALL COMPLY WITH AWS D1.1 FOR TOLERANCES, APPEARANCES, WELDING PROCEDURE SPECIFICATIONS, WELD QUALITY, AND METHODS USED IN CORRECTING WELDING WORK.
- H. COMPLY WITH AISC 303 AND AISC 360 FOR BEARING, ALIGNMENT, ADEQUACY OF TEMPORARY CONNECTIONS, AND REMOVAL OF PAINT ON SURFACES ADJACENT TO FIELD WELDS.
- I. REMOVE BACKING BARS OR RUNOFF TABS, BACK GOUGE, AND GRIND STEEL SMOOTH.

HOT-DIP GALVANIZED STRUCTURAL STEEL

- A. ALL HOT-DIP GALVANIZING WORK SHALL BE IN ACCORDANCE WITH ASTM A-123.
- B. ALL BOLTS USED FOR CONNECTIONS AT GALVANIZED STEEL MEMBERS SHALL BE GALVANIZED PER STANDARDS NOTED.
- C. REFER TO ASTM A-143, A-384 AND D-6386 FOR ADDITIONAL STANDARD PRACTICES RELATED TO SPECIAL CONDITIONS FOR HOT-DIP GALVANIZING.
- D. GALVANIZED PAINTING SURFACES AT SLIP CRITICAL CONNECTIONS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A-123 AND SHALL BE ROUGHENED BY MEANS OF HAND WIRE BRUSHING. POWER WIRE BRUSHING IS NOT PERMITTED.
- E. ALL STEEL EXPOSED TO EARTH OR WEATHER SHALL BE GALVANIZED (INCLUDING EXPOSED LINTEL ANGLES).
- F. DAMAGED AREAS, BARE SPOTS, WELDS & FIELD CONNECTIONS SHALL BE TOUCH-UP GALVANIZED PER METHODS STIPULATED IN ASTM A-780.

STRUCTURAL STEEL

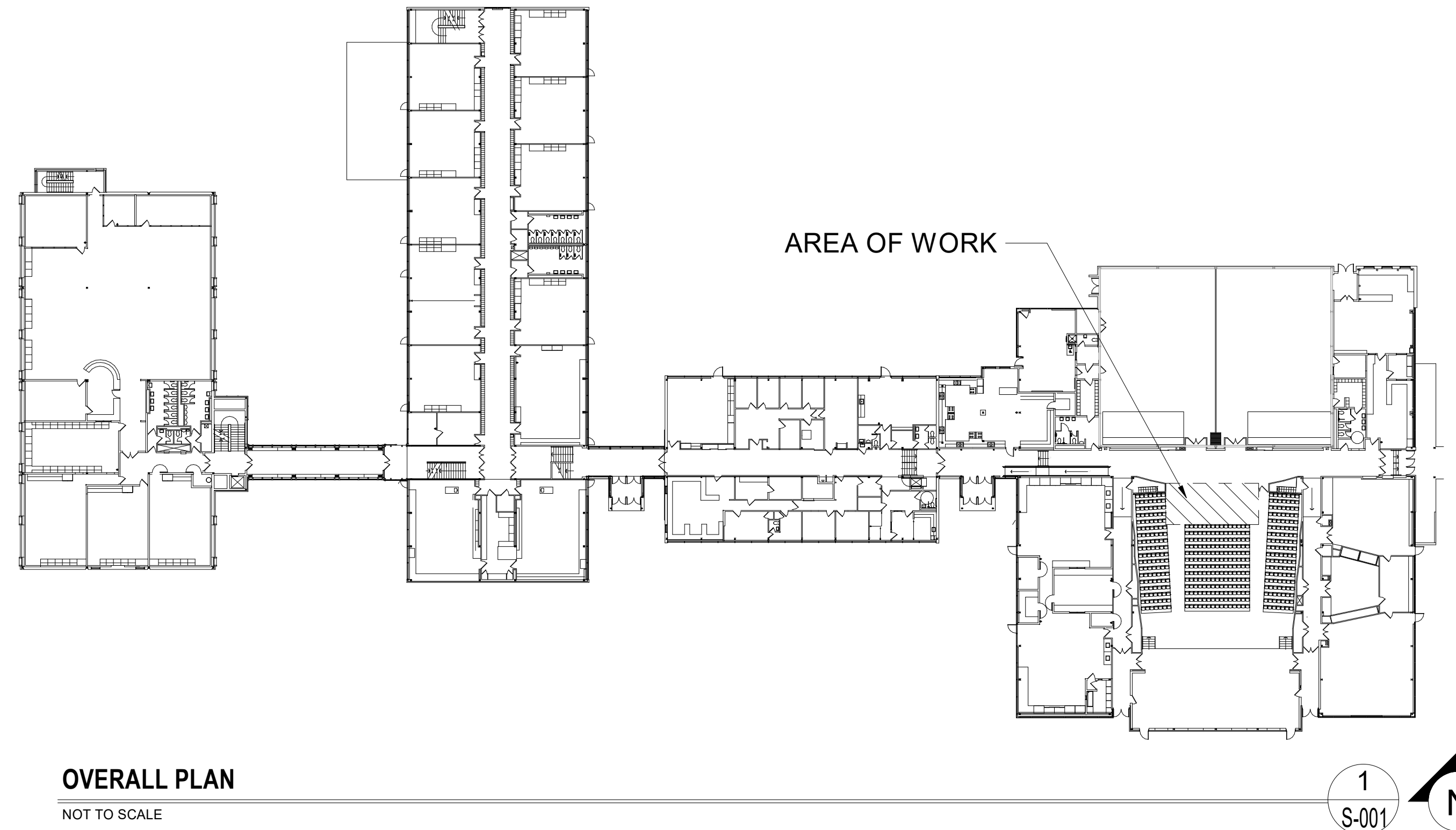
- A. ALL STRUCTURAL STEEL DESIGN AND CONSTRUCTION SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, AISC 360, & AISC SEISMIC PROVISIONS FOR STEEL BUILDINGS, AISC 341 (IF SEISMIC DETAILING IS REQUIRED).
- B. GUSSET PLATES AND STIFFENER PLATES SHALL BE 3/8" MINIMUM, WELDED BOTH SIDES CONTINUOUSLY, UNLESS NOTED OTHERWISE.
- C. POWDER ACTUATED FASTENERS (OR POWDER DRIVEN FASTENERS) SHALL BE ANCHORED IN STEEL WITH MINIMUM FASTENER SPACING OF 1 1/2" AND MINIMUM EDGE DISTANCE OF 1/2".
- D. MATERIALS:
1. W-SHAPES: ASTM A 992.
2. CHANNELS, ANGLES, M-SHAPES: ASTM A 36.
3. PLATE AND BAR: ASTM A 36.
4. COLD-FORMED HOLLOW STRUCTURAL SECTIONS: ASTM A 500, GRADE C, STRUCTURAL TUBING.
5. STEEL PIPE: ASTM A 53, TYPE E OR S, GRADE B.
6. HIGH-STRENGTH BOLTS, NUTS, AND WASHERS: ASTM A 325, TYPE 1 OR ASTM A 490 TYPE 1 HEAVY HEX STEEL STRUCTURAL BOLTS ASTM A 563, GRADE DH, HEAVY HEX CARBON-STEEL NUTS, AND ASTM F 436, TYPE 1, HARDENED CARBON-STEEL WASHERS WITH PLAIN FINISH.
7. UNHEADED ANCHOR RODS: ASTM F 1554, GRADE 36. CONFIGURATION TO BE STRAIGHT.
9. PLATE WASHERS: ASTM A 36 CARBON STEEL.
10. WASHERS: ASTM F 436, TYPE 1, HARDENED CARBON STEEL.
11. THREADED RODS: ASTM A 36.
- E. CONNECTIONS:
1. WHERE COMPLETE CONNECTION DESIGN IS NOT INDICATED IN THE STRUCTURAL DRAWINGS, CONNECTIONS SHALL BE COMPLETED BY THE STRUCTURAL STEEL FABRICATOR IN ACCORDANCE WITH DIVISION 05 PERFORMANCE SPECIFICATION REQUIREMENTS.
2. CONNECTIONS SHALL BE DESIGNED AS SNUG-TIGHT CONNECTIONS WITH THREADS IN THE SHEAR PLANE, UNLESS NOTED OTHERWISE. ALL BOLTS NOTED AS PRE-TENSIONED OR SLIP CRITICAL IN THE DRAWINGS SHALL BE TIGHTENED TO THE MINIMUM PRETENSION VALUE SHOWN IN TABLE J3.1 OF THE AISC STEEL MANUAL, USING COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATOR DEVICES CONFORMING TO ASTM F959 OR TENSION-CONTROL, HIGH STRENGTH BOLT-NUT-WASHER ASSEMBLIES CONFORMING TO ASTM 1852.
- F. CONNECTION PERFORMANCE REQUIREMENTS: PROVIDE DETAILS OF THE FOLLOWING CONNECTIONS REQUIRED BY THE CONSTRUCTION DOCUMENTS TO BE SELECTED OR COMPLETED BY STRUCTURAL-STEEL FABRICATOR, INCLUDING COMPREHENSIVE ENGINEERING DESIGN BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, TO WITHSTAND LOADS INDICATED AND COMPLY WITH OTHER INFORMATION AND RESTRICTIONS INDICATED.
1. SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE SELECTED OR COMPLETED BY AN EXPERIENCED STEEL DETAILER. TABLES IN THE AISC STEEL CONSTRUCTION MANUAL SHALL BE USED.
2. CONNECTIONS OTHER THAN SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED WORKING FOR THE FABRICATOR.
3. USE ASD, DATA ARE GIVEN AT SERVICE-LOAD LEVEL.
4. WHERE BEAM SHEAR IS NOT NOTED, THE CONNECTIONS SHALL DEVELOP THE BEAM SHEAR V + $W/2$ WHERE W IS THE TOTAL ALLOWABLE BEAM UNIFORM LOAD BASED ON LATERALLY SUPPORTED SIMPLE SPAN MOMENTS PER TABLES LOCATED IN THE AISC STEEL CONSTRUCTION MANUAL.
- G. CONNECTION SUBMITTAL REQUIREMENTS:
1. SIMPLE SHEAR CONNECTIONS: INCLUDE SUBSTANTIATING CONNECTION INFORMATION DOCUMENTING THE SHEAR CAPACITY OF A MINIMUM OF (3) REPRESENTATIVE CONNECTION TYPES ON THE PROJECT.
2. CONNECTIONS OTHER THAN SIMPLE SHEAR CONNECTIONS: INCLUDE CALCULATIONS SIGNED AND SEALED BY THE REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, WHO IS RESPONSIBLE FOR THEIR PREPARATION. ADDITIONALLY, THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OF THE CONNECTION DESIGN SHALL REVIEW AND CONFIRM IN WRITING THAT THE APPROVAL DOCUMENTS PROPERLY INCORPORATE THE CONNECTION DETAILS.
- H. PREPARE SHOP DRAWINGS SHOWING FABRICATION OF STRUCTURAL-STEEL COMPONENTS, INCLUDE DETAILS OF CUTS, CONNECTIONS, SPLICES, CAMBER, HOLES, AND OTHER PERTINENT DATA. INCLUDE EMBEDMENT DRAWINGS. INDICATE WELDS BY STANDARD AWS SYMBOLS.
- I. 1. SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE SELECTED OR COMPLETED BY AN EXPERIENCED STEEL DETAILER. TABLES IN THE AISC STEEL CONSTRUCTION MANUAL SHALL BE USED.
2. CONNECTIONS OTHER THAN SIMPLE SHEAR CONNECTIONS: CONNECTIONS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, WHO IS RESPONSIBLE FOR THEIR PREPARATION. ADDITIONALLY, THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OF THE CONNECTION DESIGN SHALL REVIEW AND CONFIRM IN WRITING THAT THE APPROVAL DOCUMENTS PROPERLY INCORPORATE THE CONNECTION DETAILS.
- J. ALL STRUCTURAL STEEL NOT RECEIVING FIRE-PROOFING SHALL RECEIVE ONE SHOP COAT OF RUST INHIBITIVE PRIMER. ALL STEEL WITH EXTERIOR EXPOSURE SHALL BE PAINTED WITH A DOUBLE COAT OF RUST PROHIBITIVE EPOXY PRIMER (MATERIAL AND THICKNESS TO BE SPECIFIED BY ARCHITECT) UNLESS NOTED AS GALVANIZED OR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.
- K. FABRICATE AND ASSEMBLE STRUCTURAL STEEL IN SHOP TO GREATEST EXTENT POSSIBLE. FABRICATE ACCORDING TO AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" AND AISC 360.
- L. PROVIDE HOLES REQUIRED FOR SECURING OTHER WORK TO STRUCTURAL STEEL. PROVIDE HOLES FOR OTHER WORK TO PASS THROUGH STEEL FRAMING MEMBERS ONLY AS SHOWN IN STRUCTURAL CONSTRUCTION DRAWINGS. CUT, DRILL, OR PUNCH HOLES PERPENDICULAR TO STEEL SURFACES. DO NOT THERMALLY CUT BOLT HOLES OR ENLARGE HOLES BY BURNING. BASEPLATE HOLES: CUT, DRILL, OR PUNCH HOLES PERPENDICULAR TO STEEL SURFACES.
- M. HIGH-STRENGTH BOLTS: INSTALL HIGH-STRENGTH BOLTS ACCORDING TO RCSC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS" FOR TYPE OF BOLT AND TYPE OF JOINT SPECIFIED. BOLTED CONNECTIONS SHALL BE SNUG TIGHTENED UNLESS NOTED OTHERWISE.
- N. PROVIDE TEMPORARY SHORES, GUYS, BRACES, AND OTHER SUPPORTS DURING ERECTION TO KEEP STRUCTURAL STEEL SECURE, PLUMB, AND IN ALIGNMENT AGAINST TEMPORARY CONSTRUCTION LOADS AND LOADS EQUAL IN INTENSITY TO DESIGN LOADS. REMOVE TEMPORARY SUPPORTS WHEN PERMANENT STRUCTURAL STEEL CONNECTIONS, BRACING, AND DIAPHRAGMS ARE IN PLACE UNLESS OTHERWISE INDICATED.
- O. SET STRUCTURAL STEEL ACCURATELY IN LOCATIONS AND TO ELEVATIONS INDICATED AND ACCORDING TO AISC 303 AND AISC 360.
- P. MAINTAIN ERECTION TOLERANCES OF STRUCTURAL STEEL WITHIN AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
- Q. ALIGN AND ADJUST VARIOUS MEMBERS THAT FORM PART OF COMPLETE FRAME OR STRUCTURE BEFORE PERMANENTLY FASTENING. BEFORE ASSEMBLY, CLEAN BEARING SURFACES AND OTHER SURFACES THAT WILL BE IN PERMANENT CONTACT WITH MEMBERS. PERFORM NECESSARY ADJUSTMENTS TO COMPENSATE FOR DISCREPANCIES IN ELEVATIONS AND ALIGNMENT. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF STRUCTURE. MAKE ALLOWANCES FOR DIFFERENCE BETWEEN TEMPERATURE AT TIME OF ERECTION AND MEAN TEMPERATURE WHEN STRUCTURE IS COMPLETED AND IN SERVICE.
- R. DO NOT USE THERMAL CUTTING DURING ERECTION.
- S. DO NOT ENLARGE UNFAIR HOLES IN MEMBERS BY BURNING OR USING DRIFT PINS. REAM HOLES THAT MUST BE ENLARGED TO ADMIT BOLTS.

ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	K	KIPS (KILOPOUNDS)
ADDL	ADDITIONAL	KLF	KIPS PER LINEAL FOOT
AESS	ARCHITECTURAL EXPOSED	KSI	KIPS PER SQUARE INCH
	STRUCTURAL STEEL	KSF	KIPS PER SQUARE FOOT
AFB	ABOVE FINISHED FLOOR	KSF	LENGTH
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	LHF	LONG FACE HORIZONTAL
AISI	AMERICAN IRON AND STEEL INSTITUTE	LFV	LONG FACE VERTICAL
ALTN	ALTERNATE	LG	LONG
AR	ANCHOR ROD	LL	LIVE LOAD
ARCH	ARCHITECT	LLH	LONG LEG HORIZONTAL
ASD	ALLOWABLE STRESS DESIGN	LLV	LONG LEG VERTICAL
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS	LO	LOW
	AMERICAN WELDING SOCIETY	LOCs	LOCATIONS
		LRFD	LOAD RESISTANCE FACTORED DESIGN
AWS	AMERICAN WELDING SOCIETY	LSH	LONG SIDE HORIZONTAL
B/	BOTTOM OF	LSV	LONG SIDE VERTICAL
BD	BOARD	LW	LONG WAY
BTW	BETWEEN	LWC	LIGHT WEIGHT CONCRETE
BLDG	BUILDING	LWC	LIGHT WEIGHT CONCRETE
BM	BEAM	MAX	MAXIMUM
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL & PLUMBING
BP	BASE PLATE	MEZZ	MEZZANINE
BRDG	BRIDGING	MFR	MANUFACTURER
BRG	BEARING	MIN	MINIMUM
CC	CENTER-TO-CENTER	MISC	MISCELLANEOUS
CFSF	COLD FORMED STEEL FRAMING	MPPI	MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS
CJ	CONTROL JOINT	MTL	METAL
CL	CENTERLINE	NIC	NOT IN CONTRACT
CLR	CLEAR	NS	NEAR SIDE
CMU	CONCRETE MASONRY UNIT	NTS	NOT TO SCALE
COL	COLUMN	OC	ON CENTER
CONC	CONCRETE	OD	OUTSIDE DIAMETER
CONV	CONNECTION	OH	OPPOSITE HAND
CONT	CONTINUOUS	OPNG	OPENING
CTR	CENTER	PAF	POWDER ACTUATED FASTENERS
D&E	DRILL & EPOXY	PEMB	PRE-ENGINEERED METAL BUILDING
D	DEEP	PJF	PREFORMED JOINT FILLER
DBA	DEFORMED BAR ANCHOR	PL	PLATE
DBL	DOUBLE	PLF	POUNDS PER LINEAL FOOT
DEP	DEPRESTED	PPHC	PRESTRESSED PRECAST HOLLOW CORE CONCRETE
DIA	DIAMETER	PREFAB	PRE-FABRICATED
DIA	DIAGONAL	PSI	POUNDS PER SQUARE INCH
DL	DEAD LOAD	PSF	POUNDS PER SQUARE FOOT
DWL	DOWEL	PT	POST TENSIONED
DN	DOWN	P.T.	PRESSURE TREATED
EA	EACH	QTY	QUANTITY
EF	EACH FACE	RAD	RADIUS
EJ	EXPANSION JOINT	RD	ROOF DRAIN
ELEV	ELEVATION	REF	REFERENCE
ENG	ENGINEER OR ENGINEERING	REIN	REINFORCING
EOS	EDGE OF SLAB	REQD	REQUIRED
EQ	EQUAL	REV	REVISION
EW	EACH WAY	RTU	ROOF TOP UNIT
EXIST	EXISTING	SCHED	SCHEDULE
EXP	EXPANSION	SER	STRUCTURAL ENGINEER OF RECORD
EXT	EXTERIOR	SF	SQUARE FOOT
F/	FACE OF	SHTHG	SHEATHING
FD	FLOOR DRAIN	SIM	SIMILAR
FDN	FOUNDATION	SLH	SHORT LEG HORIZONTAL
FF	FINISH FLOOR	SLV	SHORT LEG VERTICAL
FR	FLOOR	SPA	SPACES
FRT	FIRE RETARDANT TIMBER	SPEC	SPECIFICATION
FS	FAR SIDE	SS	STAINLESS STEEL
FTG	FOOTING	STD	STANDARD
FV	FIELD VERIFY	STIFF	STIFFENER
GA	GAUGE, GAGE	STL	STEEL
GALV	GALVANIZED	SW	SHORT WAY
GC	GENERAL CONTRACTOR	SYM	SYMMETRICAL
GIR	GIRDER	T/	TOP OF
GENL	GENERAL	T&B	TOP & BOTTOM
GYP	GYPSON	T&G	TONGUE & GROOVE
HCA	HEADED CONCRETE ANCHORS	TEMP	TEMPORARY
HDR	HEADER	TG	TRUSS GIRDER
HG	HIP GIRDER	THK	THICKENED or THICK
HGR	HANGER	THRU	THROUGH
HI	HIGH	TYP	TYPICAL
HKD	HOKED	UNO	UNLESS NOTED OTHERWISE
HORIZ	HORIZONTAL	VERT	VERTICAL
HSS	HOLLOW STRUCTURAL SECTION	W	WIDE
H.T.	HEAVY TIMBER	W/	WITH
ID	INSIDE DIAMETER	W/O	WITHOUT
IE	INVERT ELEVATION	WO	WOOD
INSUL	INSULATION OR INSULATING	WP	WORK POINT
INT	INTERIOR	WWR	WELDED WIRE REINFORCEMENT
JST	JOIST		
JT	JOINT		

STRUCTURAL SHEET LIST

S-001	GENERAL NOTES & SCHEDULES
S-002	SPECIAL INSPECTIONS
S-100	PARTIAL ROOF FRAMING PLAN



No.	Date	Description
REVISION		
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
ISSUE		
PROJECT		
Greenwich Public Schools		
WMS Auditorium AC Upgrade		
1 WESTERN JUNIOR HIGHWAY GREENWICH, CONNECTICUT		
DRAWING TITLE		
GENERAL NOTES & SCHEDULES		
Drawn By	TJL	Drawing No.
Checked By	DPA	
Date	11/13/2020	
Scale	As indicated	
Project No.	190911-000	

SPECIAL INSPECTIONS

- A. SPECIAL INSPECTIONS ARE REQUIRED IN ADDITION TO THE INSPECTIONS SPECIFIED IN SECTION 110 OF THE BUILDING CODE.
- B. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED UNDER SECTION 1705 OF THE BUILDING CODE. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO MEETS APPLICABLE REQUIREMENTS FOR SPECIAL INSPECTORS. TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
- C. SPECIAL INSPECTION AND TESTING SERVICES ARE REQUIRED TO PROVIDE A DETAILED VERIFICATION OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS, CODES AND STANDARDS SPECIFIED. SPECIAL INSPECTION SERVICES AND THE PRESENCE OF SPECIAL INSPECTORS ON SITE DO NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENT REQUIREMENTS.
- D. ALL SPECIAL INSPECTIONS ON THIS PROJECT SHALL CONFORM TO THE CONSTRUCTION DOCUMENTS AND THE APPLICABLE BUILDING CODE INCLUDING REFERENCED STANDARDS. IN ADDITION TO THIS DOCUMENT, THE SPECIAL INSPECTIONS SCHEDULE HAS BEEN SUBMITTED AS PART OF THE CONSTRUCTION DOCUMENTS. THESE DOCUMENTS DESCRIBE CONTRACTOR RESPONSIBILITIES, FABRICATOR RESPONSIBILITIES, REQUIRED INSPECTIONS/TESTING AND INSPECTION/TESTING FREQUENCY.
- E. HOLD A SPECIAL INSPECTIONS PRECONSTRUCTION MEETING AT LEAST 7 DAYS PRIOR TO INITIAL PLANNED DATE FOR START OF WORK REQUIRING SPECIAL INSPECTIONS. DISCUSSIONS SHALL INCLUDE THE REVIEW OF SPECIFICATIONS AND SCHEDULE OF SPECIAL INSPECTIONS FOR WORK REQUIRING SPECIAL INSPECTIONS. THE RESPONSIBILITIES OF CONTRACTOR, OWNER, TESTING AGENCY, SPECIAL INSPECTOR, AND REGISTERED DESIGN PROFESSIONAL, AND THE NOTIFICATION AND REPORTING PROCEDURES.
- F. SPECIAL INSPECTIONS SHALL BE PERFORMED BY AGENTS WHO HAVE RELEVANT EXPERIENCE FOR EACH CATEGORY OF INSPECTIONS. MINIMUM QUALIFICATIONS AND CERTIFICATIONS FOR EACH CATEGORY ARE INDICATED IN THE BUILDING CODE.
- G. SPECIAL TESTING AND INSPECTIONS: OWNER WILL ENGAGE AN AGENCY TO CONDUCT SPECIAL INSPECTIONS AND TESTING AS DESCRIBED IN THE REFERENCED SPECIAL INSPECTIONS DOCUMENTATION AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
1. SPECIAL INSPECTOR AND HIS AGENTS WILL NOTIFY REGISTERED DESIGN PROFESSIONAL AND CONTRACTOR OF DEFICIENCIES OBSERVED IN THE WORK.
2. SPECIAL INSPECTOR AND HIS AGENTS WILL SUBMIT A CERTIFIED WRITTEN REPORT OF EACH TEST, INSPECTION AND SIMILAR QUALITY-CONTROL SERVICE.
3. SPECIAL INSPECTOR AND HIS AGENTS WILL SUBMIT A FINAL REPORT OF SPECIAL INSPECTIONS AT THE COMPLETION OF THE SPECIAL INSPECTIONS STATING WORK WAS COMPLETED IN SUBSTANTIAL CONFORMANCE WITH CONTRACT DOCUMENTS. FINAL REPORT OF SPECIAL INSPECTIONS SHALL STATE REQUIRED INSPECTIONS HAVE BEEN COMPLETED AND ITEMIZE NONCONFORMING WORK NOT CORRECTED OR RESOLVED AS COORDINATED WITH THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. FINAL REPORT OF SPECIAL INSPECTIONS IS INCLUDED WITH THE STATEMENTS OF SPECIAL INSPECTIONS FOR USE BY THE SPECIAL INSPECTOR(S) AND HIS AGENTS.
4. SPECIAL INSPECTOR AND HIS AGENTS WILL INTERPRET TESTS AND INSPECTIONS AND STATE IN EACH REPORT WHETHER TESTED AND INSPECTED WORK COMPLIES WITH OR DEVIATES FROM THE CONTRACT DOCUMENTS.
5. SPECIAL INSPECTOR AND HIS AGENTS WILL RETEST AND REINSPECT CORRECTED WORK.
6. OWNER'S SELECTION OF A SPECIAL INSPECTOR IN NO WAY RELIEVES THE CONTRACTOR OF RESPONSIBILITY TO PERFORM WORK IN FULL COMPLIANCE WITH CONTRACT DOCUMENTS.
- H. SUBMITTALS:
1. SPECIAL INSPECTOR AND AGENCY QUALIFICATION DATA. INSPECTION AGENCIES SHALL SUBMIT A COPY OF THEIR QUALIFICATIONS, INCLUDING NAMES AND QUALIFICATIONS OF EACH INSPECTOR AND TECHNICIAN WHO WILL BE PERFORMING INSPECTIONS OR TESTS, TO THE CODE ENFORCEMENT OFFICIAL. SPECIAL INSPECTOR AND AGENCY SHALL BE ACCEPTABLE TO THE CODE ENFORCEMENT OFFICIAL.
2. REPORTS: SPECIAL INSPECTORS SHALL SUBMIT INSPECTION REPORTS OF EACH TEST OR INSPECTION TO THE CONTRACTOR, ARCHITECT OF RECORD, STRUCTURAL ENGINEER OF RECORD, DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE, AND THE OWNER. REPORTS TO BE SUBMITTED ON FORMS APPROVED BY THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. ALL DEFICIENCIES SHALL BE HIGHLIGHTED IN REPORTS AND PRESENCE OF DEFICIENCIES SHALL BE NOTED WITHIN THE REPORT TITLE.
3. PERMITS, LICENSES, AND CERTIFICATES: FOR OWNER'S RECORDS, SUBMIT COPIES OF CERTIFICATIONS, INSPECTION REPORTS, RELEASES, DEFICIENCIES, ARCHITECT/ENGINEER SKETCHES REGARDING DEFICIENCIES, CORRESPONDENCE, RECORDS, AND SIMILAR DOCUMENTS ESTABLISHED FOR COMPLIANCE WITH THE SPECIAL INSPECTIONS PROGRAM DOCUMENTED BY THE SPECIAL INSPECTION STATEMENT AND SCHEDULE.
- I. OWNER WILL ENGAGE AND PAY FOR SERVICES OF SPECIAL INSPECTOR AND HIS AGENTS AND ENGAGE EITHER THE ARCHITECT OR ONE OF HIS CONSULTANTS TO ACT AS THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND PAY FOR SERVICES OF ADMINSTRATING THIS PROGRAM.
- J. CONTRACTOR RESPONSIBILITIES:
1. CONTRACTOR TO WHOM BUILDING PERMIT IS ISSUED SHALL HAVE AND MAINTAIN RESPONSIBILITY TO MANAGE, DIRECT, AND CONTROL CONSTRUCTION ACTIVITIES ON PROJECT FOR WHICH BUILDING PERMIT IS ISSUED.
2. CONTRACTOR SHALL DESIGNATE A REPRESENTATIVE WHO SHALL BE THE DIRECT POINT-OF-CONTACT WITH THE SPECIAL INSPECTOR(S) DURING EACH PHASE OF WORK. DESIGNATED REPRESENTATIVE WILL WORK WITH THE SPECIAL INSPECTOR(S) AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE TO COMMUNICATE AND COORDINATE FOR CORRECTIVE ACTIONS REQUIRED FOR DEFICIENCIES NOTED DURING WORK PROGRESS.
3. CONTRACTOR SHALL REVIEW THE SCHEDULE OF SPECIAL INSPECTIONS TO BECOME FAMILIAR WITH ALL OF THE REQUIRED TESTING AND INSPECTIONS AND SHALL COOPERATE WITH SPECIAL INSPECTOR(S) TO PROVIDE ACCESS TO CONSTRUCTION ACTIVITIES AND MANUFACTURERS OPERATIONS THAT ARE TO BE TESTED/INSPECTED.
4. PROVIDE REQUIRED COPIES OF PRODUCT TEST REPORTS TO SPECIAL INSPECTOR(S).
5. SECURE AND DELIVER TO SPECIAL INSPECTOR(S) ADEQUATE QUANTITIES OF REPRESENTATIVE MATERIAL SAMPLES THAT REQUIRE TESTING/INSPECTION AS PART OF THE SCHEDULE OF SPECIAL INSPECTIONS.
6. PROVIDE INCIDENTAL LABOR AND FACILITIES TO FACILITATE TESTS AND INSPECTIONS THAT ARE REQUIRED BY SPECIAL INSPECTIONS AND NOTED IN THE SCHEDULE OF SPECIAL INSPECTIONS. TO PROVIDE ACCESS TO CONSTRUCTION ACTIVITIES TO BE TESTED, TO OBTAIN AND HANDLE SAMPLES AT PROJECT SITE OR AT SOURCE OF PRODUCT TO BE TESTED, FOR STORAGE AND CURING OF TEST SAMPLES.
7. NOTIFY SPECIAL INSPECTOR(S) AND HIS AGENTS AT LEAST 48 HOURS IN ADVANCE OF REQUIRED INSPECTION OR TEST WHEN TESTS OR INSPECTIONS CANNOT BE PERFORMED AFTER SUCH NOTICE. IMMEDIATELY NOTIFY SPECIAL INSPECTOR TO DISCUSS ALTERATIONS OF WORK AND SUBSEQUENT INSPECTIONS) TO ALLOW FOR REQUIRED TESTING/INSPECTION BY SPECIAL INSPECTOR(S). IF THE SPECIAL INSPECTOR IS NOT NOTIFIED IN TIME TO CANCEL AND RESCHEDULE ANY REQUIRED INSPECTION, THE CONTRACTOR SHALL REIMBURSE OWNER THROUGH CHANGE ORDER PROCEDURE FOR SPECIAL INSPECTOR(S) PERSONNEL AND TRAVEL EXPENSES INCURRED. CONTRACTOR, SPECIAL INSPECTOR, AND OWNER SHALL DEVELOP PROCEDURES AND ASSOCIATED COSTS FOR THE CHANGE ORDER PROCEDURE NOTED.
8. CONTRACTOR IS RESPONSIBLE FOR RETESTING WHERE RESULTS OF INSPECTIONS, TESTS, OR OTHER QUALITY-CONTROL SERVICES PROVE UNSATISFACTORY AND INDICATE NONCOMPLIANCE WITH CONSTRUCTION DOCUMENT REQUIREMENTS, REGARDLESS OF WHETHER ORIGINAL TEST WAS CONTRACTOR'S RESPONSIBILITY.
9. COST OF CONSTRUCTION RELATED TO RETESTING, DEFICIENCIES, CORRECTIVE WORK, REVISED OR REPLACED BY CONTRACTOR, IS CONTRACTOR'S RESPONSIBILITY WHERE REQUIRED TESTS PERFORMED ON ORIGINAL CONSTRUCTION INDICATED NONCOMPLIANCE WITH CONSTRUCTION DOCUMENT REQUIREMENTS.
10. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SITE SAFETY.
- K. SPECIAL INSPECTOR(S) RESPONSIBILITIES:
1. REVIEW ALL SPECIAL INSPECTION STATEMENTS AND THE SCHEDULE OF SPECIAL INSPECTIONS AND BECOME FAMILIAR WITH THE STRUCTURAL DESIGN FOR THE PROJECT AND CONSTRUCTION REQUIREMENTS, SUCH THAT THE INSPECTOR(S) AND HIS AGENTS MAY PROVIDE ADEQUATE VERIFICATION OBSERVATIONS TO ASSURE CONFORMANCE WITH CONSTRUCTION DOCUMENTS.
2. REVIEW CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS CITED IN SUFFICIENT DETAIL THAT HE MAY ASSURE HIMSELF THAT CONFORMANCE IS PROVIDED.
3. CONTACT LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE TO DETERMINE REQUIREMENTS FOR TESTING/INSPECTION REPORT AND NONCONFORMANCE LOG FORMATTING AND FREQUENCY. DETERMINE IF ALL REPORTING WILL BE TRANSMITTED TO DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE OR IF ANY OF THE REPORTING MUST ALSO BE TRANSMITTED DIRECTLY FROM THE SPECIAL INSPECTOR(S) TO THE LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL.
4. CONSULT WITH THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FOR CLARIFICATION REGARDING QUESTIONS FROM THE SITE, DEFICIENCIES, AND MISINTERPRETATIONS OF THE WORK.
5. ATTEND PRECONSTRUCTION MEETINGS AND ROUTINE JOB CONFERENCES CALLED BY CONTRACTOR.
6. PROVIDE ON-SITE TESTING, INSPECTIONS, AND OBSERVATIONS OF PHASES OF WORK IN ACCORDANCE WITH FREQUENCIES NOTED FOR EACH TYPE OF INSPECTION IN THE SCHEDULE OF SPECIAL INSPECTIONS AND TO ASSURE HIMSELF CONTRACTOR IS PERFORMING WORK IN ACCORD WITH CONSTRUCTION DOCUMENTS.
7. RECEIVE AND REVIEW REQUIRED CONTRACTOR SUBMITTALS FOR VERIFICATION OF CONFORMANCE TO CONSTRUCTION DOCUMENTS.
8. PROVIDE LOCAL ENFORCEMENT AGENCY/BUILDING OFFICIAL AND DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE WITH PERIODIC SPECIAL INSPECTION REPORTS, ALL TESTING/INSPECTION DOCUMENTATION, AND REPORTS OF OUTSTANDING/RESOLVED NONCONFORMANCES WITH REPORT FORMATS AND REPORT FREQUENCIES COORDINATED AT THE START OF THE SPECIAL INSPECTIONS PROGRAM.
- L. LIMITS ON AUTHORITY
1. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT RELEASE, REVOKE, ALTER, OR ENLARGE ON REQUIREMENTS OF CONTRACT DOCUMENTS.
2. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT HAVE CONTROL OVER CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION.
3. SPECIAL INSPECTOR AND HIS AGENTS SHALL NOT HAVE AUTHORITY TO STOP WORK.
- M. COMMUNICATION
1. TESTING AGENCY SHALL IMMEDIATELY NOTIFY CONTRACTOR AND REGISTERED DESIGN PROFESSIONAL BY E-MAIL OF TEST RESULTS OR INSPECTIONS FAILING TO COMPLY WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS.
2. SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY CONTRACTOR OF WORK FOUND TO BE IN NONCONFORMANCE WITH THE CONTRACT DOCUMENTS. IF NONCONFORMING WORK IS NOT CORRECTED WHILE THE SPECIAL INSPECTOR IS ON-SITE, SPECIAL INSPECTOR SHALL NOTIFY REGISTERED DESIGN PROFESSIONAL WITHIN 24 HOURS (ONE BUSINESS DAY) AND ISSUE A NONCONFORMANCE REPORT.
3. IF NONCONFORMING WORK IS NOT CORRECTED AT TIME OF SUBSTANTIAL COMPLETION OF STRUCTURE OR OTHER APPROPRIATE TIME, SPECIAL INSPECTOR SHALL NOTIFY CODE ENFORCEMENT OFFICIAL.
4. SPECIAL INSPECTOR AND HIS AGENTS SHALL SUBMIT REPORTS WITHIN 7 DAYS OF INSPECTION OR TEST.
- N. REPAIR AND PROTECTION:
1. GENERAL: UPON COMPLETION OF INSPECTION, TESTING, SAMPLE TAKING, AND SIMILAR SERVICES, REPAIR DAMAGED CONSTRUCTION AND RESTORE SUBSTRATES AND FINISHES TO ELIMINATE DEFICIENCIES, INCLUDING DEFICIENCIES IN VISUAL QUALITIES OF EXPOSED FINISHES.
2. PROTECT CONSTRUCTION EXPOSED BY, OR FOR, QUALITY CONTROL SERVICE ACTIVITIES, AND PROTECT REPAIRED CONSTRUCTION.
3. REPAIR AND PROTECTION IS CONTRACTOR'S RESPONSIBILITY, REGARDLESS OF ASSIGNMENT OF RESPONSIBILITY FOR INSPECTION, TESTING, OR SIMILAR SERVICES.

1705.2.1 REQUIRED VERIFICATION AND INSPECTION OF STRUCTURAL STEEL

MATERIAL / ACTIVITY	SERVICE ¹	APPLICABLE TO THIS PROJECT				
		Y/N	EXTENT	REFERENCED STANDARD ²	AGENT ¹	DATE COMPLETED
1. MATERIAL VERIFICATION OF STRUCTURAL STEEL	SHOP ³ AND FIELD INSPECTION	Y	PERIODIC		1	
2. EMBEDMENTS (VERIFY DIAMETER, GRADE, TYPE, LENGTH, EMBEDMENT. SEE 1705.3 FOR ANCHORS)	FIELD INSPECTION	N	PERIODIC		1	
3. VERIFY MEMBER LOCATIONS, BRACES, STIFFENERS, AND APPLICATION OF JOINT DETAILS AT EACH CONNECTION COMPLY WITH CONSTRUCTION DOCUMENTS	FIELD INSPECTION	Y	PERIODIC		1	
4. FABRICATOR AND ERECTION DOCUMENTS	SUBMITTAL REVIEW	Y	EACH SUBMITTAL	AISC360-10: N3.2.1-13	1	
5. INSPECTION TASKS PRIOR TO WELDING				AISC360-10: N5.4.5.5, & TABLE N5.4-1		
a. WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	VERIFY	Y	PERFORM	AWS D1.1-6.3	1	
b. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	VERIFY	Y	PERFORM	AWS D1.1-6.2	1	
c. MATERIAL IDENTIFICATION (TYPE/GRADE)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-6.2	1	
d. WELDER IDENTIFICATION SYSTEM (THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED, STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-6.4	1	
e. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)						
i. JOINT PREPARATION	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-6.5.2	1	
ii. DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.22	1	
iii. CLEANLINESS (CONDITION OF STEEL SURFACES)	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.15	1	
iv. TACKING (TACK WELD QUALITY AND LOCATION)	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.18	1	
v. BACKING TYPE AND FIT (IF APPLICABLE)	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-5.10 & 5.22.1.1	1	
f. CONFIGURATION AND FINISH OF ACCESS HOLES	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	AWS D1.1-6.5.2 & 5.17	1	
g. FIT-UP OF FILLET WELDS						
i. DIMENSIONS (ALIGNMENT, GAPS AT ROOT)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.22.1	1	
ii. CLEANLINESS (CONDITION OF STEEL SURFACES)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.15	1	
iii. TACKING (TACK WELD QUALITY AND LOCATION)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.18	1	
6. INSPECTION TASKS DURING WELDING				AISC360-10: N5.4, 5.5, & TABLE N5.4-2		
a. USE OF QUALIFIED WELDERS	VERIFY	Y	OBSERVE	AWS D1.1-6.4	1	
b. CONTROL AND HANDLING OF WELDING CONSUMABLES				AWS D1.1-6.2		
i. PACKAGING	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.3.1	1	
ii. EXPOSURE CONTROL	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.3.2 & 5.3.3	1	
c. NO WELDING OVER CRACKED TACK WELDS	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.18	1	
d. ENVIRONMENTAL CONDITIONS						
i. WIND SPEED WITHIN LIMITS	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AISC 360-10: N5.4 & TABLE N5.4.2	1	
ii. PRECIPITATION AND TEMPERATURE	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AISC 360-10: N5.4 & TABLE N5.4.2	1	
e. WPS FOLLOWED				AWS D1.1-6.3.3, 6.5.2, & 5.21	1	
i. SETTINGS ON WELDING EQUIPMENT	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
ii. TRAVEL SPEED	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
iii. SELECTED WELDING MATERIALS	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
iv. SHIELDING GAS TYPE/FLOW RATE	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
v. PREHEAT APPLIED	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.6 & 5.7	1	
vi. INTERPASS TEMPERATURE MAINTAINED (MIN/MAX)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
vii. PROPER POSITION (F, V, H, OH)	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE		1	
f. WELDING TECHNIQUES				AWS D1.1-6.5.2, 6.5.3, & 5.24		
i. INTERPASS AND FINAL CLEANING	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.30.1	1	
ii. EACH PASS WITHIN PROFILE LIMITATIONS	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE			
iii. EACH PASS MEETS QUALITY REQUIREMENTS	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE			
7. INSPECTION TASKS AFTER WELDING				AISC360-10: N5.4, 5.5, & TABLE N5.4-3		
a. WELDS CLEANED	SHOP ³ AND FIELD INSPECTION	Y	OBSERVE	AWS D1.1-5.30.1	1	

1705.2.1 REQUIRED VERIFICATION AND INSPECTION OF STRUCTURAL STEEL (CONT.)

MATERIAL / ACTIVITY	SERVICE ²	APPLICABLE TO THIS PROJECT				
		Y/N	EXTENT	REFERENCED STANDARD ³	AGENT	DATE COMPLETED
b. SIZE, LENGTH, AND LOCATION OF WELDS	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-6.5.1	1	
c. WELDS MEET VISUAL ACCEPTANCE CRITERIA				AWS D1.1-6.5.3		
i. CRACK PROHIBITION	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (1)	1	
ii. WELDBASE-METAL FUSION	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (2)	1	
iii. CRATER CROSS SECTION	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (3)	1	
iv. WELD PROFILES	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (4) & 5.24	1	
v. WELD SIZE	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (6)	1	
vi. UNDERCUT	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (7)	1	
vii. POROSITY	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-TABLE 6.1 (8)	1	
d. ARC STRIKES	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-5.29	1	
e. K-AREA	SHOP ³ AND FIELD INSPECTION	N	PERFORM	WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3" OF THE WELD.	1	
f. BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED BY CONSTRUCTION DOCUMENTS)	SHOP ³ AND FIELD INSPECTION	N	PERFORM	AWS D1.1-5.10 & 5.31	1	
g. REPAIR ACTIVITIES	SHOP ³ AND FIELD INSPECTION	Y	PERFORM	AWS D1.1-6.5.3 & 5.26	1	
h. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	DOCUMENTATION	Y	PERFORM	AWS D1.1-6.5.4 & 6.5.5	1	
i. NONDESTRUCTIVE TESTING (NDT) OF WELDED JOINTS ⁵ :				AISC360-10: 5.5a-g		
1. COMPLETE PENETRATION GROOVE WELDS IN MATERIALS 5/16" THICK OR GREATER IN RISK CATEGORY III OR IV	SHOP ³ AND FIELD INSPECTION	N	PERFORM (100%)	AWS D1.1	1	
2. COMPLETE PENETRATION GROOVE WELDS IN MATERIALS 5/16" THICK OR GREATER IN RISK CATEGORY II	SHOP ³ AND FIELD INSPECTION	N	PERFORM (10%)	AWS D1.1	1	
3. THERMALLY CUT SURFACES OF ACCESS HOLES WHEN MATERIAL 1" x 2"	SHOP ³ AND FIELD INSPECTION	N	PERFORM		1	
4. WELDED JOINTS SUBJECT TO FATIGUE WHEN REQUIRED BY AISC 360, APPENDIX 3, TABLE A-3.1	SHOP ³ AND FIELD INSPECTION	N	PERFORM		1	
5. FABRICATOR'S NDT REPORTS WHEN FABRICATOR PERFORMS NDT	VERIFY	N	EACH SUBMITTAL ⁶		1	
8. INSPECTION TASKS PRIOR TO BOLTING				AISC360-10: N5.6 & TABLE N5.6-1		
a. MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	VERIFY	N	PERFORM	RCSC-2.1 & 9.1	1	
b. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-FIG. C-2.1 & 9.1	1	
c. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-2.3.2, 2.7.2, & 9.1	1	
d. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-4 & 8	1	
e. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-3, 9.1 & 9.3	1	
f. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	SHOP AND FIELD INSPECTION/ DOCUMENTATION	N	OBSERVE	RCSC-7 & 9.2		
g. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS, AND OTHER FASTENER COMPONENTS	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-2.2, 8, & 9.1	1	
9. INSPECTION TASKS DURING BOLTING				AISC360-10: N5.6 & TABLE N5.6-2		
a. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.1 & 9.1	1	
b. JOINT BROUGHT TO THE SNUG TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.1 & 9.1	1	
c. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.2 & 9.2	1	
d. FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE POST RIGID POINT TOWARD THE FREE EDGES	SHOP ³ AND FIELD INSPECTION	N	OBSERVE	RCSC-8.2 & 9.2	1	
10. INSPECTION TASKS AFTER BOLTING				AISC360-10: N5.6 & TABLE N5.6-3		
a. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	DOCUMENTATION	N	PERFORM		1	
11. INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION PRIOR TO CONCRETE PLACEMENT				AISC360-10: N6 & TABLE N6.1		
a. PLACEMENT AND INSTALLATION OF STEEL DECK	SHOP ³ AND FIELD INSPECTION	N	PERFORM		1	
b. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	SHOP ³ AND FIELD INSPECTION	N	PERFORM		1	
c. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS	DOCUMENTATION	N	PERFORM		1	

SPECIAL INSPECTIONS FOOTNOTES

1. THE INSPECTION AND TESTING AGENT(S) SHALL BE ENGAGED BY THE OWNER OR THE OWNER'S AGENT, AND NOT BY THE CONTRACTOR OR SUBCONTRACTOR WHOSE WORK IS TO BE INSPECTED OR TESTED. ANY CONFLICT OF INTEREST MUST BE DISCLOSED TO THE BUILDING OFFICIAL PRIOR TO COMMENCING WORK. THE QUALIFICATIONS OF THE SPECIAL INSPECTOR(S) AND/OR TESTING AGENCIES MAY BE SUBJECT TO THE APPROVAL OF THE BUILDING OFFICIAL AND/OR THE DESIGN PROFESSIONAL.
2. THE LIST OF SPECIAL INSPECTORS MAY BE SUBMITTED AS A SEPARATE DOCUMENT, IF NOTED SO ABOVE.
3. INSPECTION OF FABRICATORS IS NOT REQUIRED WHERE THE FABRICATOR IS APPROVED IN ACCORDANCE WITH IBC SECTION 1704.2.5.1.
4. IN ADDITION TO THIS DOCUMENT, SEE SPECIAL INSPECTION REQUIREMENTS NOTED IN THE GENERAL NOTES OF THE CONSTRUCTION DOCUMENTS AND DIVISION 01 SPECIFICATIONS.
5. SEE REFERENCED STANDARDS FOR ADDITIONAL CLARIFICATION REGARDING INSPECTION SERVICES, TESTING, EXTENTS REQUIRED, AND MODIFICATIONS TO INSPECTIONS AND TESTING BASED ON INSPECTION AND TESTING RESULTS.
6. NDT OF WELDS COMPLETED IN AN APPROVED FABRICATOR'S SHOP MAY BE PERFORMED BY THAT FABRICATOR WHEN APPROVED BY THE AHJ. REFER TO AISC 360, N7.
7. ALL SPECIAL INSPECTIONS SHALL BE SUBMITTED ELECTRONICALLY AS REPORTS PER CHAPTER 17 REQUIREMENTS. SEE IBC SECTION 1704.2.4 FOR CLARIFICATION OF REPORT REQUIREMENTS. SEE SPECIFIC CODE OR STANDARD REFERENCE WHERE ADDITIONAL DOCUMENTATION IS REQUESTED.
8. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE AS INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR OR ADHESIVE, ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 18.2 IN THE RESEARCH REPORT. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.
9. REQUIRED BEFORE EACH CONCRETE POUR OF FOUNDATION ELEMENTS, WALLS, COLUMNS, BEAMS, ELEVATED AND ON-GRADE SLABS WITH SUFFICIENT TIME ALLOWED FOR INSPECTION OF COMPLETED INSTALLED REINFORCING PRIOR TO POUR.
10. 10% (BUT NOT LESS THAN TWO) OF ALL POST INSTALLED ADHESIVE ANCHORS SHALL BE TESTED PER THE PROOF LOADING REQUIREMENTS OF ACI 355.4 SECTION 13.3.4. THESE ANCHORS SHALL BE SELECTED AT RANDOM BY THE SPECIAL INSPECTOR, WHERE 100% OF ANCHORS DO NOT PASS TESTS, A FURTHER 50% OF ALL INSTALLED ANCHORS SHALL BE TESTED. ADHESIVE ANCHORS NOT REQUIRING PROOF ROLLING SHALL BE EXPLICITLY DENOTED IN THE CONSTRUCTION DOCUMENTS.
11. CONCRETE MASONRY ADHESIVE ANCHORS SHALL BE TESTED IN ACCORDANCE WITH REQUIREMENTS ASSOCIATED WITH ACI 355.4 SECTION 13.3.

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11/13/2020

No.	Date	Description
		REVISION
2	11/13/20	100% CD
1	07/22/19	100% SD FOR REVIEW
No.	Date	Description
		ISSUE

PROJECT

Greenwich Public Schools
WMS Auditorium AC Upgrade

1 WESTERN JUNIOR HIGHWAY
GREENWICH, CONNECTICUT

DRAWING
TITLE

**SPECIAL
INSPECTIONS**

Drawn By

TJL

Drawing
No.

Checked By

DPA

Date

11/13/2020

Scale

1" = 1'-0"

Project No.

190911-000

S-002